

**JANUARY
1954**

chemical processing

for men who manage

Highlights

Chemicals from natural gas
bought about the \$50 mil-
lion plant pictured at right.
The story of the Tuscola
plant seepage 42

Water-based and Water-
proof — a new concept in
coatings 22

27 reports on other chemical
materials this month

Arm Products beats the
corrosion problem . . . 72

One of this month's 6 reports
on combatting corrosion

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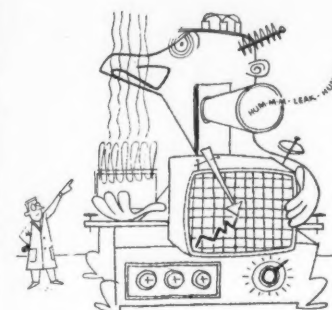
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Technical service representatives in principal cities of the United States, Canada, Mexico and other foreign countries.



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The Fresh'nd Aire Co., Div. of Cory Corp., Grayslake, Ill., detects leaks of Freon 12 gas in hermetically sealed air conditioning systems and dehumidifiers by means of a sensitive General Electric Type H leak detector. This mechanical sniffer is so sensitive that it reportedly can find leaks small enough so that a period of five years would pass before the loss would put the unit out of commission. The "nose" gives both audible and visual indication when it "smells" Freon.

Making hay

This term is generally thought of as meaning a profitable operation. This isn't true, however, in a paper mill where it means that the web of paper has broken and is piling up on the floor like stacks of hay, instead of staying on the reel where it belongs.

Pogonotomy

It has nothing to do with the study or use of pogo sticks. The Greeks coined the word way back when, and it means "shaving" or "beard trimming."

You'll never believe it, but that stubble that confronted you in the mirror too early this morning is just 15/1000th of an inch longer than it was when you finished that smooth shave too early yesterday morning.

As if it mattered, (we still hate shaving) whisker density on the male face varies from 325 to 550 per sq in on the cheeks, and from 260 to 780 per sq in on the chin. At least we don't need tweezers to get 'em off. (Ethyl News)

For more information on product at left, specify CP 5659 ... see information request blank between pages 2 - 3.

Vol. 17

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JANUARY

chemical processing

(CHEMICAL PROCESSING PREVIEW)

For MEN WHO MANAGE

Vol. 17 January, 1954 No. 1

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FLOWLINE Fittings are made by specialists whose entire efforts are devoted to making corrosion-resistant fittings. The unique features of these fittings are the result of our exclusive method of cold-forming and annealing, which puts them in the best condition for corrosion service. With FLOWLINE fittings, users of corrosion piping can obtain the full economies and efficiencies of butt-welded construction.

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In this Issue

Cowboy Chemistry in Texas



Just as the cowboy reflected the spirit of the old Southwest, the oil driller and the chemical worker with their hard plastic helmets symbolize that region today. Although cowboys still ride the range in Texas, some of them are lassoing molecules and changing them "into something rich and strange."

Chemicals that make possible latex paint of superior washability give us one example of this modern type of ranching, encountered during a recent editorial trip in Texas. See story starting on page 32.

Among other articles soon to appear in this chemical roundup is one describing how waste refinery gases have been utilized to form a variety of valuable petrochemicals.

Although Texas has many advantages for chemical manufacturing, one disadvantage is that the Gulf Coast is one of the most corrosive areas in the world. Year 'round high temperatures and humidities, the salt air, combined with chemical fumes can corrode metal overnight. Ways have been found, however, to control corrosion in this great outdoor laboratory. Article beginning on page 72 tells how an entire plant is being protected with an asphaltic coating.

Cathodic protection is being widely used to combat corrosion of pipe lines, tank bottoms, and other underground structures. First article in a series on this increasingly important method of corrosion control begins on page 9.

Other Texas stories coming up include one on use of grid trays for producing aromatics, a second on application of infrared plant stream analyzers in a refinery, and a third on a rotary dryer in a rubber plant. Another one in this issue, page 16, describes use of a recently developed thermocouple gland in a Corpus Christi refinery.

Several stories will appear about outstanding accomplishments of the Dow plants, which constitute one of the largest combined chemical operations on earth.

Gordon Weyermuller

ASSOCIATE EDITOR

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Editor

John C. Vaaler

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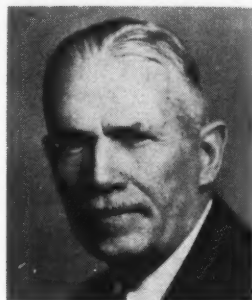
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The Chemical Industry and National Security

GENERAL BREHON D. SOMERVELL
General, United States Army (Retired)
Chairman and President, Koppers Company, Inc.



Upon graduation from the Military Academy at West Point in 1914, he was commissioned a second lieutenant. He advanced through the grades to the rank of full general. As chief of the Army Service Forces in World War II, he had great responsibility for the industrial mobilization of America. Upon his retirement from the Army in 1946, he became associated with the Koppers Company, Inc., and is now its Chairman and President.

pers Company, Inc., and is now its Chairman and President.

America's strength as a world power lies in a large measure in its chemical industry. Chemicals, in one form or another, play an increasingly important part in every phase of our existence. Among all of the sciences, none touches us in our daily lives so intimately and so often as does chemistry.

Here are two facts that add up into one thought: First, almost every American production process must rely upon the chemical industry for some item; second, America's biggest industry is now the chemical industry. The resulting thought: a key to America's defense program lies in its chemical industry. Thus, the two sets of words, "national defense" and "chemical industry" can be considered practically synonymous.

From personal experience I know what the chemical industry means to the military. Let's take the individual soldier for an example. From the very first day he enters the service, when he gets his first shot of vaccine, his life is influenced by chemicals in one way or another. His clothing, his equipment, his weapons, his physical well-being, are all dependent upon the American chemical industry. And should he be hurt, whether in training or in combat, new biochemicals have increased his chances of a safe and speedy recovery.

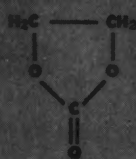
For example, when the extraordinary therapeutic value of sulfanilamide first came to the attention of the medical profession, a vast research program covering the new drugs was carried out, both by the military and by private industry. Serious problems were involved.

Finally, a group of commercial production and research men from Monsanto found the answers. Test samples looked good. Within six days the Surgeon General had tested the new form they had developed and given his approval. Within a week the re-worked product was being sent to the Armed Forces. Every soldier's first aid packet soon contained a small envelope of sulfanilamide. How many lives it saved is hard to say, but the figure was enormous.

Another example of what chemicals meant in the winning of the war, is napalm.

(Continued on page 159)

Have you tried these versatile
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PROPYLENE CARBONATE



THEIR HIGH SOLVENT POWERS are winning for them an ever-widening popularity as solvents and peptizing agents for polyacrylonitrile, nylon, silicones, lignin and many other polymeric materials. They are also highly effective solvents for a number of inorganic salts. These facts are particularly significant to the textile, paper and allied industries.

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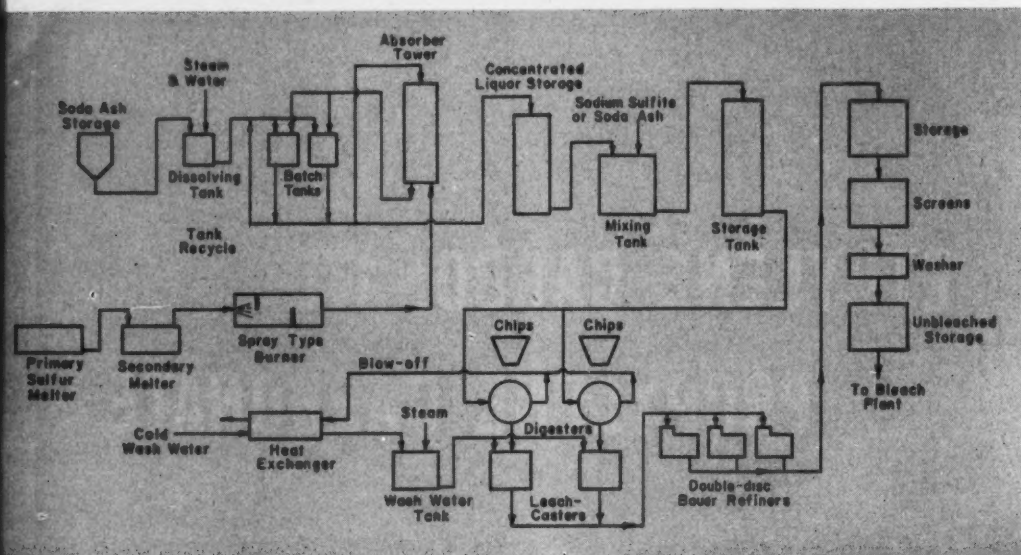
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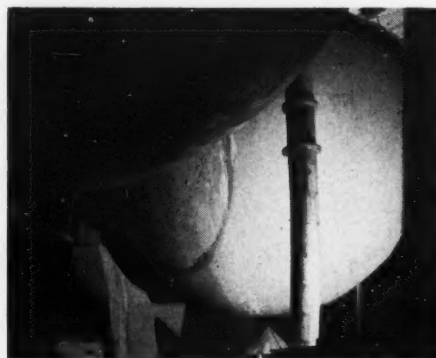
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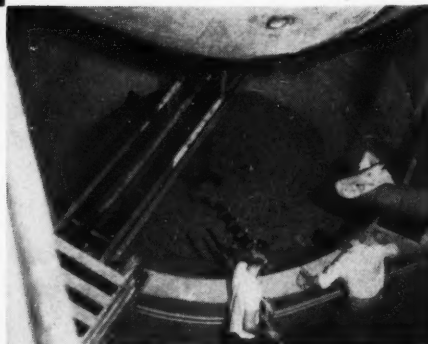
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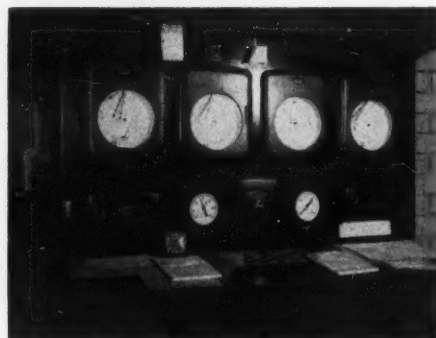
Simplified flowsheet of Rhinelander semi-chemical pulping process



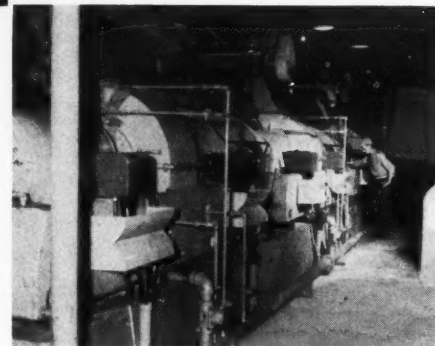
Two 16' diameter spherical rotary digesters are used in process. Duct in front of rear digester carries excess chips being returned from refiner line



Control panel of cook room. Temperature and pressure inside digesters are recorded by Foxboro recorders at top; control, however, is manual



Under each digester is a Leach-Caster into which cooked chips are dumped, washed and drained before going to refiners. Paddles on revolving arms push chips to outlet (at right) after draining



Three Bauer double-disc refiners receive cooked and washed chips

*new solutions
of processing problems*

semi-chemical neutral sulfite pulping of aspen under way at Rhinelander Paper Company

Maker of glassine, greaseproof and other fine specialty papers now doesn't have to rely on hard-to-get spruce alone

Around the first of May (1953), Rhinelander Paper Company started operating its new neutral sulfite semi-chemical pulping process in Rhinelander, Wis. Aspen, or poplar, can now be used — to a limited degree — instead of spruce, stands of which are dwindling in the area. The papers made from the semi-chemical pulp include glassine, greaseproof, and other fine specialty types. Although it's too early to present firm figures on the papers, it is apparent that unbleached aspen semi-chemical is as strong as sulfite spruce.

Rhinelander still considers the process in the "experimental" stage, and of course this is not at all unusual for a venture so comprehensive and new in a company. Thus, the accompanying simplified flowsheet and description are subject to change.

As can be seen by a study of the flowsheet, the process sticks pretty close to established methods. However, there are a few points which should be of more than passing interest. A spray type sulfur burner is used, and amount of secondary air introduced is controlled automatically by continuous monitoring of SO_2 content of gases leaving the burner. The control system consists

of a Superior SO₂ Recorder (conductivity principle) working in conjunction with a Brown controller-recorder.

Under each of the two 16' diameter spherical rotary digesters is a Leach-Caster (of original design). Cooked chips are dumped into these and washed with hot water. A series of plows on revolving arms moves the chips to the outlet of the unit after they have drained. From here the chips are carried to the three Bauer refiners by a series of conveyors and elevators. As is customary, more chips are fed to the refiner line than they can take; excess is returned to the Leach-Caster.

(The Editors thank the personnel of Rhinelander Paper Company for their part in preparation of this story.)

Bearing failures reduced, grease consumption cut with lithium lubricant

**Six greases replaced by multi-purpose
lubricant which withstands dust,
acid, water, high loads**

Problem: A large chemical plant in the Midwest had frequent bearing failures due to unsatisfactory lubrication. Severe conditions were present in plant, which manufactures sodium aluminum sulfate (alum), aluminum sulfate, and sulfuric acid. Chief hazards encountered are sulfate dust, sulfuric acid, excessive water (wash-downs, etc), shock loading, and temperatures to 275°F.

Solution: Three years ago, plant started using lithium-base 12-hydroxystearate multi-purpose grease. At present, 92% of all requirements are met by this type of lithium grease, which replaced six types formerly used. Two other types used in plant are silicone and molydisulfide lubricants. These are used for special high temperature and friction applications, such as roaster pans or sliding pistons.

Included in equipment being lubricated with multi-purpose grease are all types of conveyors and elevators, bagging machines, shafting and agitating equipment, crushers, and anti-friction bearings.

Results: Since lithium 12-hydroxystearate grease has been used in plant, bearing failures have been reduced considerably. Grease has withstood severe conditions in chemical plant and has resulted in notable improvements in bearing performance. Purchasing inventory, storage have been simplified. Only about one third of storage space formerly required is now used. Fewer types of grease on hand has also helped to prevent misapplication.

Typical example of improved performance achieved with this lithium grease is the Raymond Pulverizing Mill. With types of grease previously used, bear-

(Continued on next page)

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Asphalt	Perchlorates
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Barium Chloride	Phosphate
Barium Sulphate	(High Grade Residue)
Beryllium Sulphate	Polystyrene
Black Ash	Polyvinyl Acetate
Borax	Polyvinyl Alcohol
Butyl Acetate	Polyvinyl Chloride
Butyl Polymer	Potassium Carbonate
Calcium Carbonate	Potassium Chloride
Calcium Nitrate	Potassium Hydroxide
Carborundum	Potassium Nitrate
Carboxymethyl Cellulose	Potassium Sulphate
Carmelite	Potato Starch
Cellulose Acetate	Sodium Bichromate
Chromium Oxide	Sodium Carbonate
Coal, bituminous and anthracite	Sodium Chloride
Coffee	Sodium Fluoride
Copper Sulphate	Sodium Hydroxide
Copperas	Sodium Nitrate
Corundum	Sodium Nitrite
Cryolite	Sodium Stannate
Di-Sodium Phosphate	Sodium Sulphate
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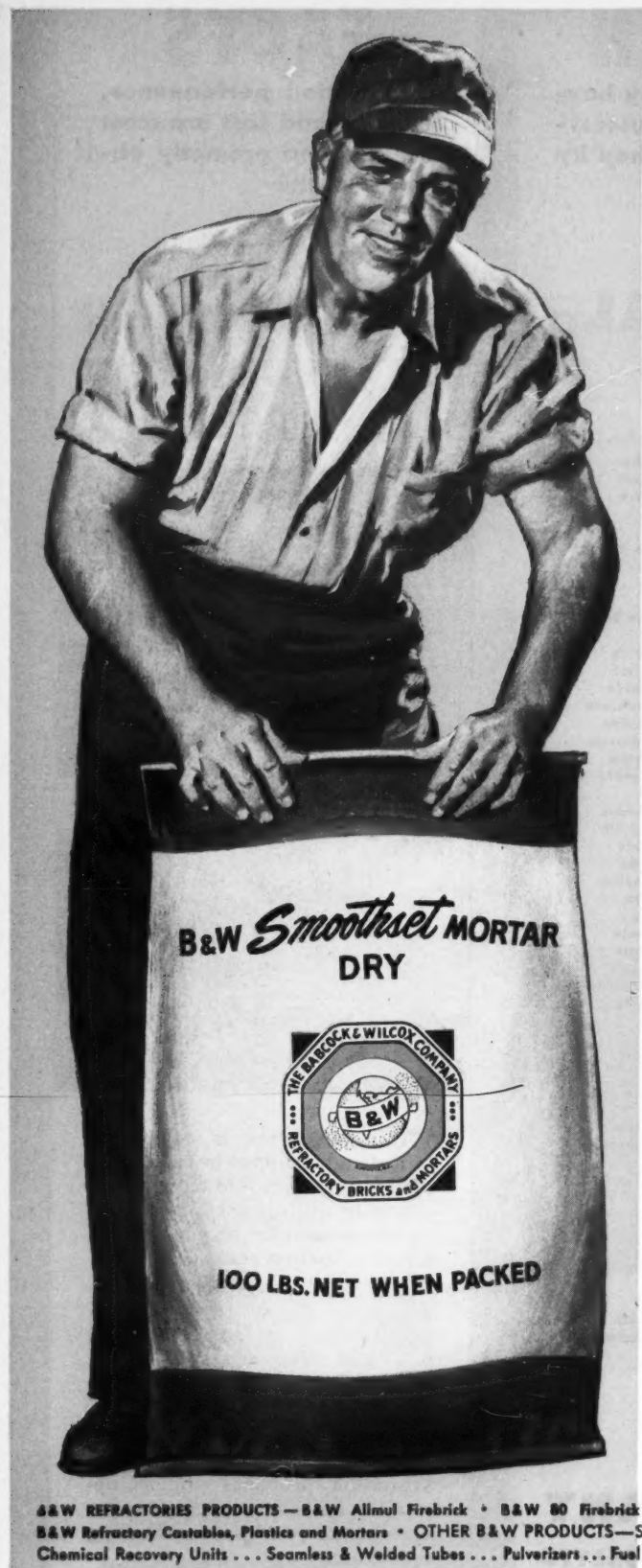


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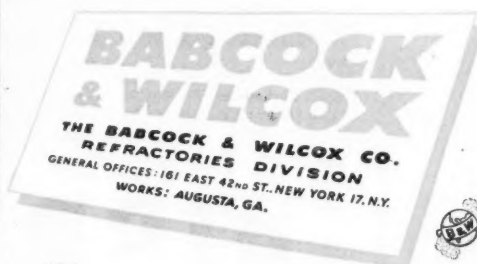
Available in Dry Form

Here's the mortar refractories masons asked for—and it's as easy to use with insulating firebrick as the popular wet B&W Smoothset because it has the same high water retention.

This property is important because the highly porous structure of insulating firebrick draws the moisture rapidly from the mortar, thus allowing too short a time for proper placing and setting of the brick before most mortars become unworkable.

Besides high water retention, the new dry B&W Smoothset can be stored indefinitely in a dry place without hardening—a big advantage on large jobs when refractories are installed over a long period of time.

In addition to helping you select the most economical refractories, your local B&W Refractories Engineer will be glad to help you select the best mortar for your installation. Next time you build or reline your furnace, get the benefit of his long experience



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Chemical Recovery Units... Seamless & Welded Tubes... Pulverizers... Fuel Burning Equipment... Pressure Vessels... Alloy Castings

NEW SOLUTIONS of processing problems

(Continued from preceding page)

ings had to be changed an average of twice a week. Since changing to this lithium grease, it has not been necessary to change bearings for six months.

Another case concerns a Rotex Screener, which has operated for four months without need for changing the bearings. Previously, an average of two bearing failures a week occurred.

A third piece of equipment whose operation was improved with lithium-base lubricant is a pan-type long chain conveyor. This equipment is subject to constant water spray action while running hot. Ensuing steam played havoc with grease and bearings. Lithium grease of 12-hydroxy stearate type shows high water tolerance and no undue trouble has been experienced since the switchover.

One of the toughest grease applications is on the six bearings of a Jeffrey Gyratory Crusher. This equipment, driven by a 60 hp motor, is used for pan-hardened sulfate, causing excessive dust and considerable heat. Lithium grease stands up under the high loading and dust hazard.

In the acid plant considerable difficulty had been experienced with sulfuric acid fume contamination of greases. Washing down procedures also exposed previously used sodium soap greases to saponification. Bearing failures from both of these troubles have been eliminated with lithium base grease. In fact, this grease has functioned with as much as 52.5% water present.

In addition to using lithium-base grease in this midwestern plant, chemical company is using it on about 95% of some 500 pieces of equipment in an eastern plant where fine chemicals and pharmaceuticals are manufactured. Also, another midwestern plant and a second eastern plant of company are now replacing many specialty lubricants with multipurpose lithium grease and anticipate similar improvement in maintenance.

Another important factor in preventing misapplication, in addition to use of fewer types of grease, has resulted from a series of lubricating surveys undertaken by company in its 17 processing plants, aimed at improving inspection and checking procedures.

One of the first things done after a survey is completed is to standardize on grease fittings. As a result, one type of fitting will only operate guns loaded with lithium grease, while another will only operate guns loaded with silicone grease or molydisulfide.

(Alvania lithium base multi-purpose grease is product of Shell Oil Co., 50 W. 50th St., New York 20, N. Y. . . . check CP 5664, pages 2 and 3.)

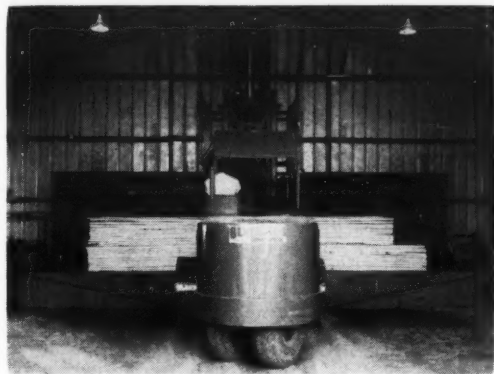
Processing & Engineering Data
starts on page 158

When inquiring check CP 5663 on handy form, pgs. 2-3

Magnesium anode cathodic protection prevents corrosion of underground tanks and piping . . .

Wood-Protection Co. installs system to guard against costly leaks and repairs

Problem: Two years ago, the Wood-Protection Co. of Houston, Texas, opened its modern plant for preservation of wood. Since facilities are expensive for this operation, best means possible was desired for protecting underground tanks and piping from corrosion. Plant has two 10,000 gal underground solution storage tanks and an 8000 gal rectangular treating chamber, 2/3 of which is below ground. Tanks are interconnected with 4", 6", and 8" pipe lines.



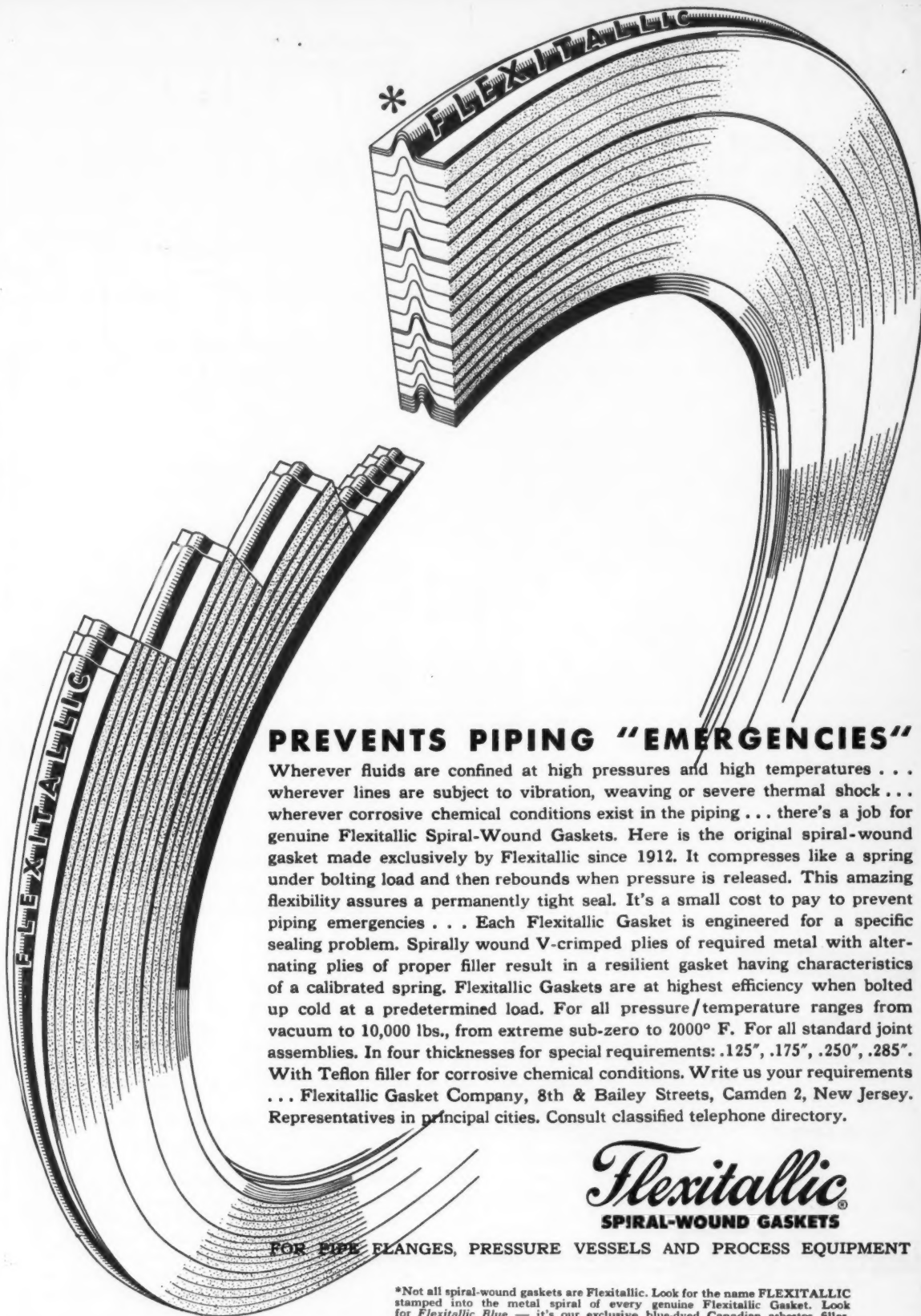
Lumber being transferred to cathodically protected vacuum tank for treatment

Storage tanks contain the two solutions available for use in wood preservation process. One of the solutions is Penta, a 5% solution of pentachlorophenol in petroleum oil. The other is Woodlife, which consists of 5% chlorinated phenols, water repellents, and solvent. A leak on these tanks would be difficult to repair, and could also result in loss of solution worth several times the cost of a protective system.

Since wood treating chamber must withstand 29" vacuum, it is made of heavy steel plate and the sides of the vessel have concrete around them in the underground portion. This construction makes it difficult to find and repair a leak. Although loss of solution would be costly, it would be equally disastrous for water to enter tank and emulsify the solution. Underground tanks and pipe lines received an asphaltic coating upon installation, but some additional method of protection was required for the equipment.

Solution: In August, 1953, Wood-Protection Co. installed a cathodic protection system. In planning system, consideration was given to fact that portion of vacuum tank below ground was placed in a sand fill. Clay type terrain in which underground facilities are located has an average resistance of 700 ohm-cm, which is corrosive with respect to underground metal structures. Since tests

(Continued on page 14)



PREVENTS PIPING "EMERGENCIES"

Wherever fluids are confined at high pressures and high temperatures . . . wherever lines are subject to vibration, weaving or severe thermal shock . . . wherever corrosive chemical conditions exist in the piping . . . there's a job for genuine Flexitallic Spiral-Wound Gaskets. Here is the original spiral-wound gasket made exclusively by Flexitallic since 1912. It compresses like a spring under bolting load and then rebounds when pressure is released. This amazing flexibility assures a permanently tight seal. It's a small cost to pay to prevent piping emergencies . . . Each Flexitallic Gasket is engineered for a specific sealing problem. Spirally wound V-crimped plies of required metal with alternating plies of proper filler result in a resilient gasket having characteristics of a calibrated spring. Flexitallic Gaskets are at highest efficiency when bolted up cold at a predetermined load. For all pressure/temperature ranges from vacuum to 10,000 lbs., from extreme sub-zero to 2000° F. For all standard joint assemblies. In four thicknesses for special requirements: .125", .175", .250", .285". With Teflon filler for corrosive chemical conditions. Write us your requirements . . . Flexitallic Gasket Company, 8th & Bailey Streets, Camden 2, New Jersey. Representatives in principal cities. Consult classified telephone directory.

Flexitallic
SPIRAL-WOUND GASKETS

FOR PIPE FLANGES, PRESSURE VESSELS AND PROCESS EQUIPMENT

*Not all spiral-wound gaskets are Flexitallic. Look for the name FLEXITALLIC stamped into the metal spiral of every genuine Flexitallic Gasket. Look for Flexitallic Blue — it's our exclusive blue-dyed Canadian asbestos filler.

When inquiring check CP 5665 on handy form, pgs. 2-3

Perhaps



SULPHUR DIOXIDE Is What You Need!



If you have a particular job that calls for a superior reducing or bleaching agent, preservative, antichlor, pH control, or neutralizer . . . Tennessee's highest quality Sulphur Dioxide will do it better. Ordinarily a more efficient and economical operation can be realized through the use of this chemical (SO_2) with its varied and extended uses.

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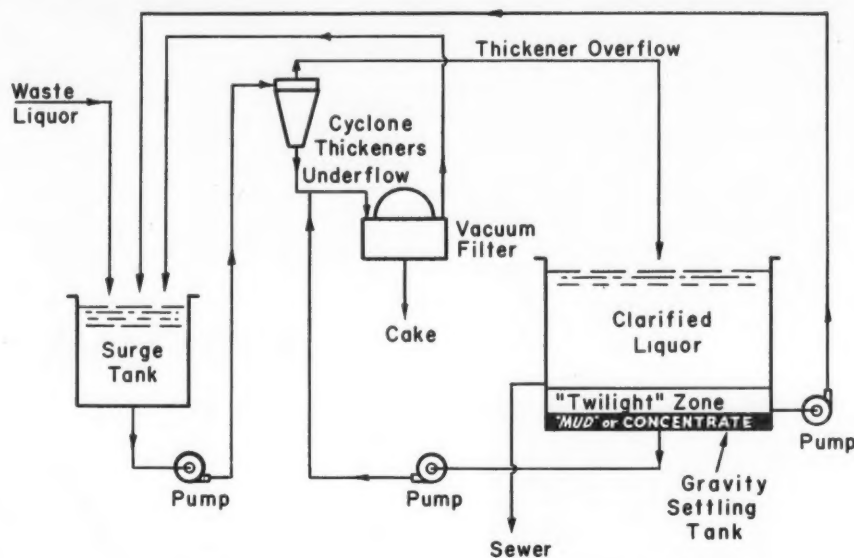


For detailed information,
phone, wire or write—

TENNESSEE **CORPORATION**

617-29 Grant Building, Atlanta, Georgia

*new solutions
of processing problems*



Flowsheet of rubber-fines reclamation process now in operation at B. F. Goodrich in Akron

Goodrich recovers almost all rubber fines in waste liquors from digester reclaiming

**Cyclone thickeners double recovery
of minus 40 mesh material, assure
cleaner effluent to sewer system**

Problem: Large quantities of aqueous waste liquors containing 1 to 3% of minus forty mesh rubber fines and degraded cellulose are produced in the digester rubber reclaiming process carried out at The B. F. Goodrich Company, Akron, Ohio. Not only is recovery of the solids, particularly the rubber fines, economically desirable but also clarification of the liquor is mandatory since it must be disposed of via the municipal sanitary sewer.

Until recent production increases and process changes increased the quantity of waste liquor generated and altered the settling characteristics of the solids, generally satisfactory solids-recovery and clarification were obtained by means of gravity settling tanks. When the existing settling capacity became inadequate, and since no space was available for additional settling tanks, it became necessary to find either an entirely different clarification procedure or a method of reducing the solids load in the existing tanks.

Solution: A manifold of 22 three-inch cyclone thickeners was installed between the source of waste liquor and the settling tanks. The liquor is pumped into the top of each cone through a tangential inlet orifice at about 40 psi. The resultant liquid vortex develops such centrifugal force that the larger and heavier solids are thrown against the side of the cone and are carried down and out of the underflow orifice at the bottom as a 15 to 35% solids concentrate.

About 95% of the volume of liquid fed to the cone and the smaller and lighter solids, mostly degraded cellulose, leave the cyclone at the top through the central overflow orifice. This overflow is run into any one of the settling tanks where it is processed in the conventional manner.

After the solids have settled, the clarified effluent is drained to the sewer, an intermediate "twilight" zone is returned to the cyclone thickener feed line, and the concentrate or "mud" from the bottom of the tank is mixed with the underflow concentrate from the cyclones and fed to continuous vacuum filters.

Results: From 40 to 60% of the solids in the waste liquor are recovered immediately in the

When inquiring check CP 5666 on handy form, pgs. 2-3

underflow concentrate from the cyclone thickeners. This underflow concentrate is an excellent filter feed and has markedly improved filter performance.

The use of cyclone thickeners as a supplement to the existing settling tanks has increased the amount of solids recovered by about 100% and has provided a concomitant improvement in the quality of the effluent to the sewer.



Here's the type of cyclone thickener manifold being used in the Goodrich installation

Virtually all of the rubber fines are recovered by the system. Any solids that are carried on to the sewer are degraded cellulose, material much less detrimental to sewage disposal operations than rubber.

(The Editors sincerely thank R. K. Carr of B. F. Goodrich for the information for this article.)

(Cyclone thickener setup was supplied by Heyl & Patterson, Inc., Dept. CP, 55 Fort Pitt Blvd., Pittsburgh 22, Pa. . . . check CP 5667, pages 2 and 3.)

Marathon finds valve-type bags and sacker unit save time and labor . . .

bag size standardized; inventory decreased, and one man can now accomplish work of two

Problem: At the Marathon Corporation's Chemical Division in Rothschild, Wis., there were three open-mouthed sacker installations to handle dispersants and other surface active materials coming from two vacuum drum dryers and two double drum atmospheric dryers. In addition, a portable sewing machine was used to close the bags containing products from these dryers.

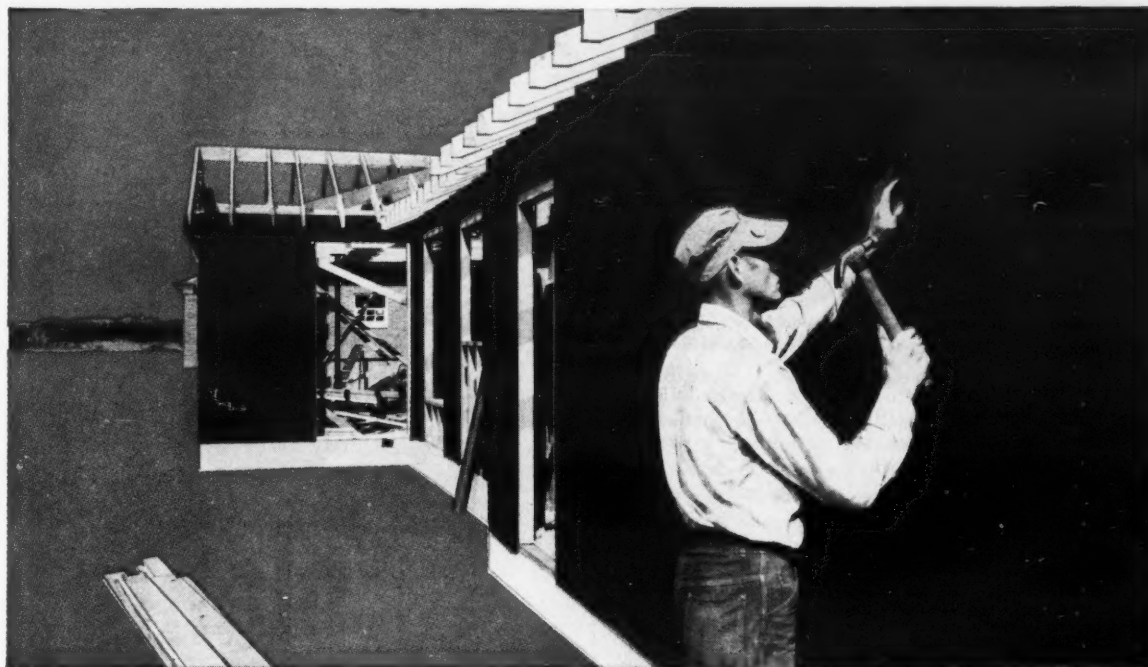
Compared with sacking of products from the plant's spray dryer, which used a sacker for valve-type bags, this operation was an awkward one requiring services of two sacker men and it produced a good deal of dustiness around the sackers.

Solution: While modernizing their complete plant layout, Marathon added a second spray dryer installation incorporating a sacker for valve-type

(Continued on next page)

DOWICIDE PRESERVATIVES ADD LIFE TO INSULATING BOARD

Manufacturers of cellulosic materials control rot and termite damage using DOW industrial preservatives



The Dow Chemical Company
Department DP-1628C
Midland, Michigan

Please send me detailed information on
DOWICIDE PRESERVATIVES.

Name _____

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Company _____

Address _____

City _____ State _____

Manufacturers of well-known brands of exterior sheathing board are getting positive, long-lasting mold, bacteria and termite control using a DOWICIDE® PRESERVATIVE. The positive protective action of the DOWICIDES gives much longer life to this popular building and insulating material. They keep it free from rot and mold under the most extreme moisture and temperature variations.

There are *fourteen* DOWICIDE PRESERVATIVES, each designed for a specific mold and bacteria problem. They are being used extensively in the textile, leather, latex paint, paper and many other industries.

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Call upon Dow for a solution to your mold and bacteria problems. Write today for detailed information about DOWICIDE PRESERVATIVES. THE DOW CHEMICAL COMPANY, Midland, Michigan.

you can depend on DOW CHEMICALS



When inquiring check 5668 on handy form, pgs. 2-3

(Continued from preceding page)



Operator filling valve-type bag at sacker unit. Note ease and neatness of operation, and absence of dust

bags. Shortly thereafter, they standardized their sacking devices by installing sackers for use with valve-type bags at both the vacuum and atmospheric drum dryer locations.

Result: With the sackers and valve-type bags Marathon has been able to standardize on a uniform bag size for almost all products, with a consequent decrease in various types of bags formerly found necessary to inventory. Cost of sacker installation is said to have been less than if old equipment had been replaced with new units of the same type (and new sewing machines.) In present operation one man can now handle the sacking from all four drum dryers.

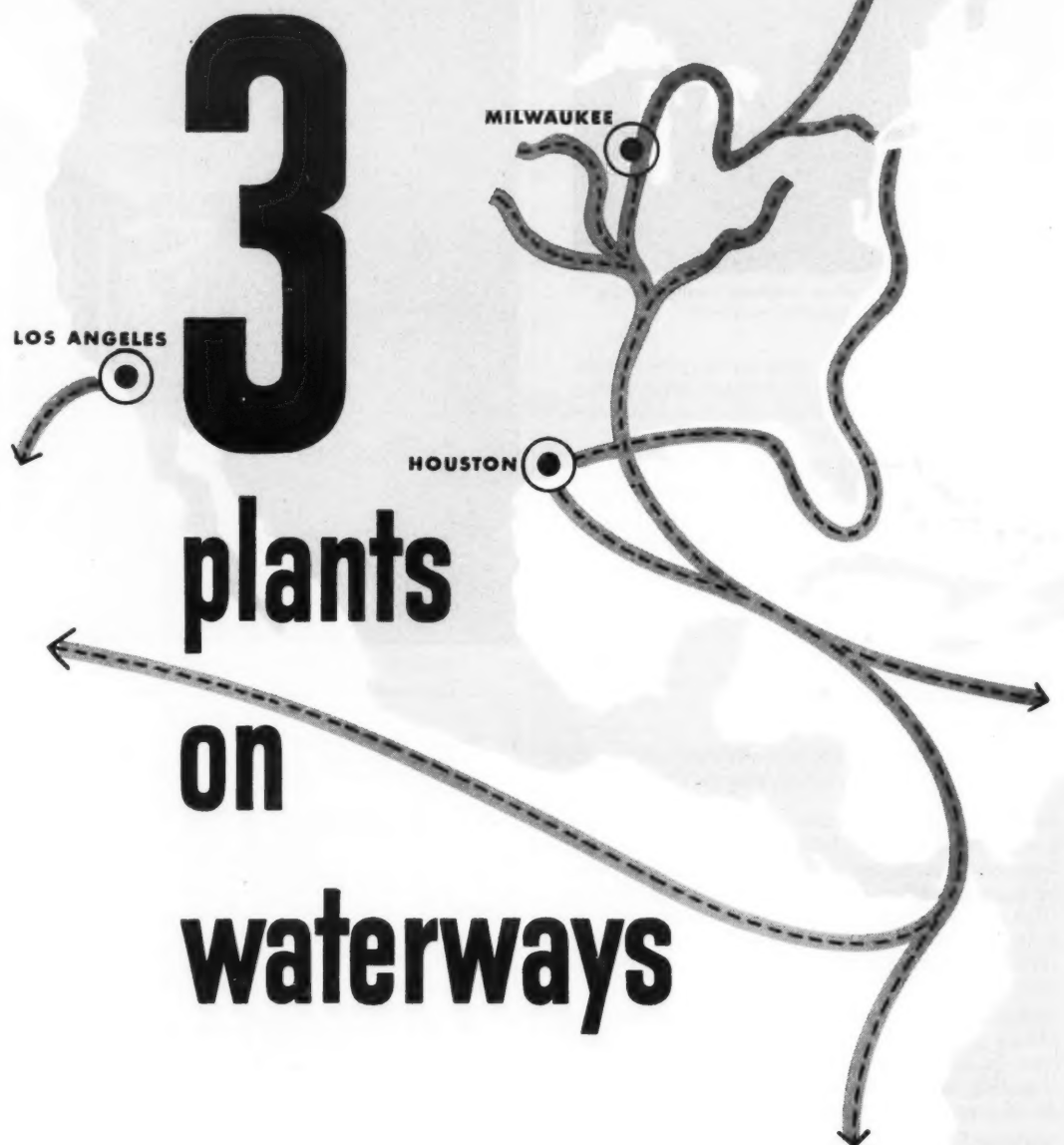
(Sacker for valve-type bags is a product of E. D. Coddington Mfg. Co., Dept. CP, 5024 N. 37th St., Milwaukee 9, Wis. . . . or for more information check CP 5669 on the convenient Reader Service slip located between pages two and three.)

All metal bead removed from cracked tires in rubber reclaiming . . .

magnetic pulleys also make sure that all rubber goes into process instead of scrap

Problem: After cracking tires at start of rubber reclaiming process conducted by U. S. Rubber Reclaiming Co., Inc., in Buffalo, N. Y., it was necessary to remove the metal bead by a special operation. Even though this special de-beading step required a quantity of manpower, complete separation of metal and rubber couldn't be effected.

A. O. Smith for outstanding advantages





124,000-pound SMITHlined Coking Drum being loaded on a freighter for direct shipment from Milwaukee to an important refinery in Germany via the Great Lakes-St. Lawrence Seaway to Hamburg. Its dimensions are 14 feet ID, 53 feet length.

Our Milwaukee, Houston and Los Angeles vessel plants are all on waterways providing economical, direct transportation to domestic and foreign ports.

From these plants, direct shipment of the largest pressure vessels and heat exchangers can be made economically. This gives our customers, whose processing plants are convenient to waterways, important advantages and economies.

Their erection problems and expenses are cut considerably when fractionators, converters, accumulators and other large size processing vessels can be delivered in one or, at most, two pieces.

Field assembly costs are avoided or greatly reduced and much time is saved.

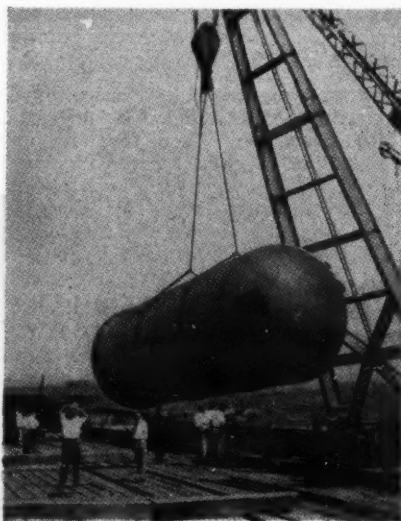
For further information about A. O. Smith pressure vessels, heat exchangers, and the outstanding advantages our customers enjoy, we invite you to write our Milwaukee office.



A.O. Smith
CORPORATION

VESSELS AND HEAT EXCHANGERS

MILWAUKEE HOUSTON LOS ANGELES
International Division: Milwaukee 1, Wisconsin



A 299,000-pound vacuum tower being loaded on a barge for shipment from Houston to New Orleans through the Intracoastal Canal. There, it was loaded on a steamer and shipped to South America. It is 18 feet in diameter, 64 feet in length.



A 320,000-pound SMITHlined Fractionating Tower being unloaded at Whiting, Indiana. It was barged down Lake Michigan from Milwaukee. It is 16 feet in diameter, 107 feet in length, and shop-fabricated in one piece to avoid costly field assembly before erection at the refinery site.

When inquiring check CP 5670 on handy form, pgs. 2-3

NEW SOLUTIONS of processing problems

As a result, company was losing 10% of weight of tire in rubber and 5% in steel. So, not only was the company losing rubber which could be reclaimed at a profit, but it was also losing bead metal which could be sold at a good price.

Solution: Eight permanent magnetic pulleys have been placed in conveyor system following cracking rolls. System separates rubber and metal bead and moves scrap metal to waiting gondola cars or trailer trucks. Rubber goes on to further processing steps.

Results: Complete separation permits company to recover all of the rubber and steel entering plant. Special de-beading operation has been eliminated, and six men previously needed for the step have been placed on other work. The 8000 lb of bead wire recovered every day is sold at a "very handsome" price.

(Magnetic pulleys used here were made by Eriez Manufacturing Company, Dept. CP, Erie, Pa. . . . or for more information check CP 5671 on handy form, pages 2 and 3.)

Quick-change paint test panels form part of wall . . .

permits closer approximation of field conditions

Instead of using easels and other special set-ups to test paint brushability, covering power, drying rates, etc., interchangeable 4 x 6' panels, installed as part of a wall, can be used to advantage. Panels shown in accompanying photo are held in place by quickly



opened wing-type window-screen clips, so it is a simple matter to change panels when desired.

This type of testing comes closer to conditions found in actual painting practice, since the paint is applied and dried in much the same way as it would be in the field.

(Information obtained during visit to McDougall-Butler Co., Incorporated, 2929 Main Street, Buffalo 14, New York.)



Awards that foretell your gain

Chemicals from coal hydrogenation...

...acclaimed the 1953 Chemical Engineering Achievement!

IN 1933 Carbide received the first Chemical Engineering Achievement Award. This recognized the beginning of commercial production of much-needed chemicals from petroleum and natural gas—which proved to be the beginning of the American petrochemical industry.

HISTORY REPEATS—Now, just twenty years later, Carbide has received the 1953 Chemical Engineering Achievement Award for “the first successful production of chemicals from coal by a high pressure hydrogenation process.”

In minutes, coal becomes gases and liquids rich in needed chemicals—“one of the major contributions in this century to the well-being of us all.”

Some of these chemicals are used in making plastics, synthetic rubber, pharmaceuticals, vitamins, and many other things. Others are completely new and hold great promise.

FOURTH RECOGNITION—Carbide is the first two-time individual recipient of this award. It also is the fourth time the people of Carbide have been recognized, for they shared in two previous group awards—in 1943 for synthetic rubber, and in 1946 for atomic energy.

TRUE SIGNIFICANCE—As in all Chemical Engineering Achievement Awards, coal hydrogenation was recognized not as the accomplishment of any one individual but as the result of the cooperative efforts of many.

The people of Union Carbide appreciate the recognition of their achievement by the distinguished Committee of Award, composed of senior chemical engineering educators.

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AND CARBON CORPORATION
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PYROFAX Gas DYNEL Textile Fibers UNION Carbide
PREST-O-LITE Acetylene

LINDE Oxygen
NATIONAL Carbons
ACHESON Electrodes

When inquiring check CP 5672 on handy form, pgs. 2-3

NEW SOLUTIONS of processing problems

(Continued from page 9)

showed that a nominal amount of DC current would be needed, a magnesium anode type cathodic protection system was recommended.

Installation consists of five 32-lb Galvo-Pak magnesium anodes placed in 8" augered holes to a depth of 7'. Two anodes were installed beside each of the storage tanks and one anode near the vacuum tank. Storage tank anodes are located 10' from one side on 6' centers from a line through center of tank. Anode near vacuum tank is located approximately 20' from one side. Anodes are placed to also give protection to interconnecting piping. Anode lead wires are attached to tanks by the Cadweld process.

Insulation materials were furnished to Wood-Protection Co. personnel for use in isolating protected structures from foreign contacts, such as power company's grounded neutral.

Results: Cathodic protection system was surveyed after installation by taking potential measurements of protected structure to earth employing a potentiometer voltmeter and a copper/copper sulfate reference electrode. Tests revealed that at all locations potentials were well above the desired-0.85 volt protective level.

Cathodic protection system was designed for optimum performance on the basis of a ten-year replacement life. Magnesium type system is of such a nature that little or no maintenance will be required. Caution should be taken, however, if excavations are necessary near anode lead wires. Common failure of an installation of this type is breakdown or by-passing of electrical insulation, with protected equipment becoming “shorted” to foreign structures. It was recommended that annual engineering resurveys be made to see that protective potentials remain stable.

(Galvo-Pak magnesium anodes are product of The Dow Chemical Co., Midland, Mich. . . . or check 5673A, pages 2 and 3.)

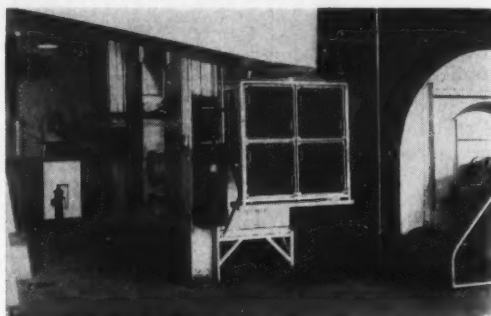
(Installation was engineered and made by Cathodic Protection Service, Dept. CP, 4601 Stanford St., Houston 6, Tex. . . . or for more information check CP 5673B, pages 2 and 3.)

Ohio Match saves \$145/day by switch to absorption type air-drying method . . .

system maintains best temperature and humidity for efficient, practical match drying

Problem: Although the mechanical refrigeration method for maintaining correct temperature and humidity in the match drying room of Ohio Match Company did its job well, cost of operation was high. Close control of the temperature and humidity is necessary for drying of the matches.

Solution: When replacement of the old system became necessary, the company installed a chemical absorption type system in its stead. This de-



Compact installation of chemical absorption type dehumidifying system

humidifies incoming makeup air, mixes it with recirculated room air, and cools the mixture (70,000 cfm) to 70°F and 32% RH, at which point it is sent to the drying room. In humid weather, 50 barrels of moisture are removed from the air per day.

Results: Savings in operating costs — labor, power, and steam — run as high as \$145 per day in the summer months. Big portion of these savings is due to the fact that the air does not now have to be dehumidified by excessive cooling and then reheated to the temperature of the drying room. Ohio Match figures that the new system will pay for itself within two years.

(Kathabar systems, such as that used here, are supplied by Surface Combustion Corp., Dept. CP, Toledo 1, Ohio . . . or for more information check CP 5674 on handy form, pages 2 and 3.)

High temperatures, dampness, chemical fumes withstood by coating . . .

hydrocarbon finish in excellent condition after one year at Brooklyn Color Works

Problem: Brooklyn Color Works, manufacturers of fine colors in Brooklyn, N. Y., had been plagued for 15 years with corrosion caused by a combination of high temperatures, dampness, and chemical fumes. To combat the condition, plant had tried numerous anti-corrosive paints and compounds without success. None was effective for more than six months.

In addition to product cost, each application required scaffold construction, with accompanying time and labor costs. Need for replacement of equipment continued throughout the years. The condition became so bad that several years ago it became necessary to replace all the roof beams.

Solution: In July, 1952, a coating known as Pro-Tex-It and another product were applied side by side in some of the worst trouble spots. Pro-Tex-It consists of a heat stable hydrocarbon base and inert pigment and surface active agents. Coating is a non-drying black paste. Term "non-

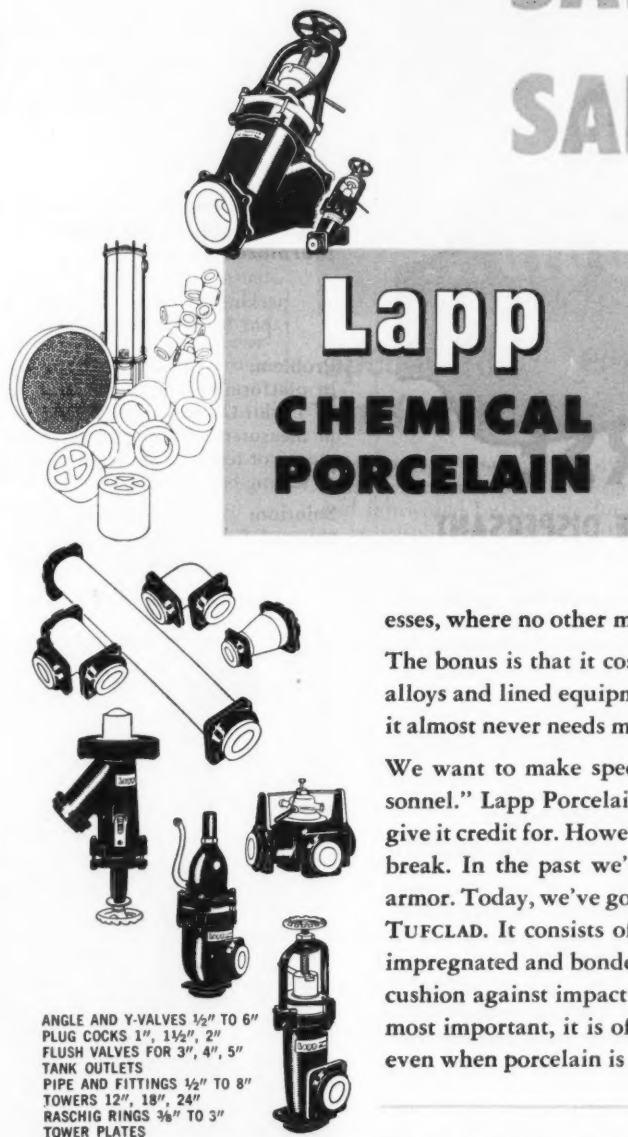
(Continued on next page)

SAFEST way to handle acid corrosion

SAFE from corrosion

SAFE from contamination

SAFE for plant and personnel



ANGLE AND Y-VALVES 1/2" TO 6"
PLUG COCKS 1", 1 1/2", 2"
FLUSH VALVES FOR 3", 4", 5"
TANK OUTLETS
PIPE AND FITTINGS 1/2" TO 8"
TOWERS 12", 18", 24"
RASCHIG RINGS 3/8" TO 3"
TOWER PLATES

For problems involving severe corrosion, or elimination of contamination, best bet is a material chemically inert to product being handled—and it should be hard, smooth, strong, and non-porous.

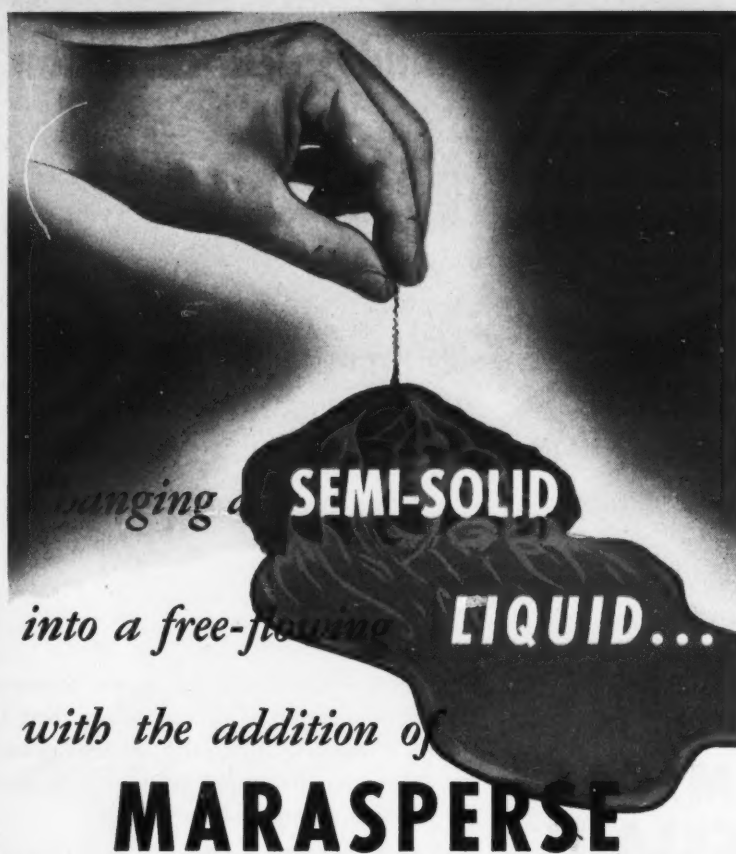
That's a description of Lapp Chemical Porcelain—and a list of characteristics which have won it a permanent place in hundreds of plants, and hundreds of processes, where no other material ever gave as satisfactory service.

The bonus is that it costs a lot less initially than most corrosion-resistant alloys and lined equipment. And the economy is increased in the fact that it almost never needs maintenance or replacement.

We want to make special mention of the item "safe for plant and personnel." Lapp Porcelain is much tougher and stronger than most people give it credit for. However, under severe shock, physical or thermal, it will break. In the past we've supplied our equipment with several types of armor. Today, we've got the simplest, most economical, and best. We call it TUFCLAD. It consists of multiple layers of heavy fiberglass woven cloth, impregnated and bonded with an Epoxide resin. This armor shell acts as a cushion against impact damage, and insulator against thermal shock. But most important, it is of itself strong and tough—will hold line pressures even when porcelain is cracked or broken.

For your problem of corrosion or contamination, Lapp Chemical Porcelain may bring you a new standard of untroubled service, improved quality and lowered cost. Write for description and specifications. Lapp Insulator Co., Inc., Process Equipment Division, 167 Wendell St., Le Roy, N. Y.

When inquiring check CP 5675 on handy form, pgs. 2-3



hanging a **SEMI-SOLID**
into a free-flowing **LIQUID...**

with the addition of

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THE low cost, HIGHLY EFFECTIVE DISPERSANT

With the addition of from 0.05% to 3.0% of MARASPERSE, up to 300% MORE SOLIDS MAY BE DISPERSED and maintained in fluid suspension.

You can use Marasperse to:

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3. Make stable oil-in-water emulsions.

If you have a process, or a use involving one of your products, which requires water suspensions of insoluble materials, investigate the use of Marasperse dispersants.

Write for File No. 801 for additional information on Marathon's low-cost Marasperse. You'll receive interesting and informative technical data.

Marasperse products are used in making water-suspensions of pigments, sulfur, clays, and additives for compounding of synthetic rubber. As deflocculants in size classification systems. As dispersing agents for dyestuffs, wettable powder pesticides, and industrial cleaners. As deflocculants in the manufacture of ceramic ware, as scale inhibitors in boiler water treatment and as conditioners for oil well drilling fluids.

 **MARATHON** Corporation
CHEMICAL DIVISION
ROTHSCHILD • WISCONSIN

When inquiring check CP 5676 on handy form, pgs. 2-3

NEW SOLUTIONS of processing problems

(Continued from preceding page)

drying" means that its flexibility and resiliency are retained after application. It can be applied to metal, wood, and concrete surfaces.

Results: After one year, it was found that the hydrocarbon base coating looks the same as the day it was applied, the surfaces covered with it being perfectly protected. Other product applied at same time was no better than those previously used. With this experience, plant used hydrocarbon coating in all corrosive areas, with the expectation that they would be protected from corrosion for an extensive period.

(Pro-Tex-It coating is product of American Sand-Banum Co., Inc., Dept. CP, 9 Rockefeller Plaza, New York 20, N. Y. . . . check CP 5677, pages 2-3.)

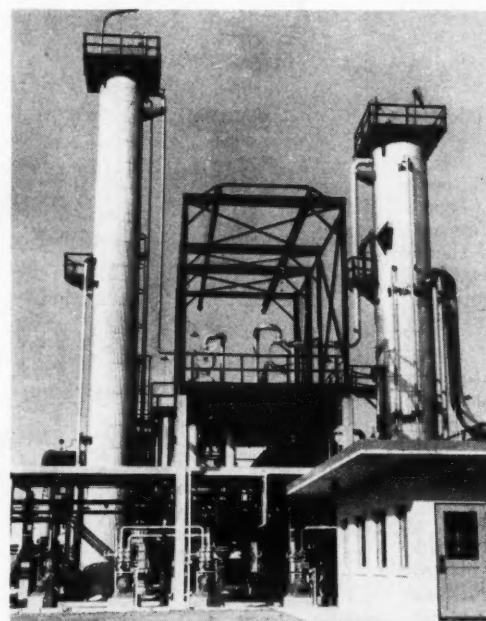
Taylor Oil and Gas Co. provides positive seal for unshielded thermocouple wires . . .

packing gland permits use of bare wires for rapid temperature response

Problem: Unshielded thermocouple wires used in platforming unit of the Corpus Christi refinery of Taylor Oil and Gas Co. provide greater accuracy of measurement and control than any other known means of temperature sensing. A practical method of sealing bare wires in columns was needed.

Solution: On Aug. 1, 1953, a recently developed C-U-P (change under pressure) thermocouple gland was installed in the pre-fractionating

(Continued on page 18)



Arrow shows position of thermocouple gland installed in platforming unit at Taylor Oil and Gas Co

This YORKMESH DEMISTER

means
Clean Separation
in a
Vacuum Tower



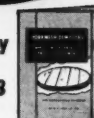
RESULT:

Cleaner gas oil with reduction in carbon and metals contamination which means increased yield of higher octane gasoline from your cat cracker.

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LUBE VACUUM TOWERS
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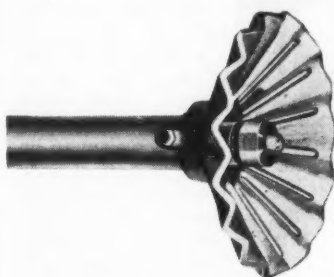
When inquiring check CP 5678
on handy form, pgs. 2-3

CHEMICAL PROCESSING

Refinery sludge application withstood for 3 months by alloy burner tips . . .

previously steel tips failed after a few days

Problem: In a cracked gasoline sludge burning application at the Avon Refinery of Tidewater Associated Oil Co. in California, steel burner tips being used failed anywhere from several hours to three or four days after being



Resistance to acids and heat is furnished by chrome-nickel alloy burner tips as shown in above photograph

placed in service.

Solution: Burner tips cast of Illium G, a high chrome-nickel alloy, were used. This alloy has exceptional resistance to heat, erosion, and corrosion from sulfuric, phosphoric, nitric, and mixed acids of many types and concentrations.

Results: Illium tips have stood up under grueling service for three months. Durability of burner tips has eliminated costly downtime for burners. The illium tips are also said to be easy to keep clean.

(For further information contact The Illium Corporation, Department CP, Freeport, Illinois . . . or for more information about manufacturer's product, reader may simply check CP 5679 on the convenient Reader Service slip located between pages two and three.)

For more information on product at right, specify CP 5680 . . . see information request blank between pages 2-3.

PROCESS EQUIPMENT NEWS

PUBLISHED BY FABRICATED PRODUCTS DIVISION, THE M. W. KELLOGG COMPANY

JANUARY 1954

Unique Bundle Puller Makes Gains Abroad

Kellogg's Hydro-Ejector, a special device for hydraulically removing and retracting tube bundles, is now standard equipment in many refineries. The use in the United States has generated considerable interest abroad, and independents as well as U. S. affiliates are using this portable unit to speed maintenance work.

Experience has proved that two men can handle even the largest bundles, taking less than 25 minutes to perform the operation of ejecting or retracting any size unit a distance of eight feet. The Hydro-Ejector can exert a force of 12,000 pounds, sufficient to overcome dirt formations that cause many bundles to stick.



Special High-Temperature Exchangers for Gasoline-from-Coal Synthesis

Illustrated is one of ten unique heat exchangers especially designed and fabricated by Kellogg for use in a gasoline-from-coal synthesis plant under construction in South Africa. This exchanger is being made ready for hydrostatic testing.

When in service the units will perform a highly critical function in the pre-heating of gas in a catalytic reforming unit. Each capable of operating under temperatures of 1625°F and pressures of 365 psi, the exchangers are being fabricated in Kellogg's shops rather

than overseas because of Kellogg's extensive engineering and fabrication experience in production of alloy equipment for handling critically high temperatures and pressures.

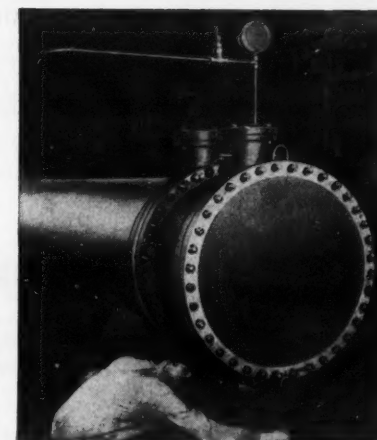
Tubes and tube sheets of the exchangers are fabricated of Type 310 stainless steel. The shells are internally insulated.

In the reforming unit, residual hydrocarbons in synthesis gas, produced in the coal gasification plant, and recycle gas from the synthesis section are converted to additional synthesis gas.

Reflux Exchanger for Combination Unit

This reflux-crude exchanger is one of many exchangers, coolers and condensers recently completed in the shops for a combination refinery in Brazil. Here it is shown undergoing hydrostatic testing.

The unit is 35" inside diameter, of steel construction throughout, using 3/4" OD tubes on square spacing. When installed the unit will preheat crude against reflux gas oil raising its temperature from 60° to 280°F.



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IMPORTANT
BY-PRODUCT HERE!**



Type N ROTO-CLONE ▶

**eliminates stack gas nuisance from
rotary kiln operations at Westvaco Chemical**

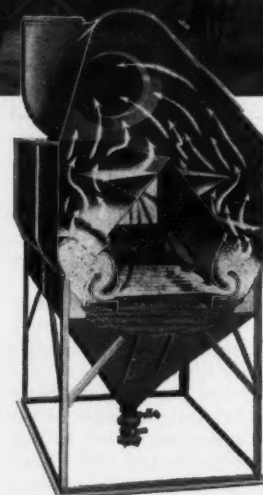
The Westvaco Chemical Division, Food Machinery and Chemical Corp. operates two rotary kilns at its Modesto, Calif., plant for processing barite ore. The larger kiln, pictured above, has a capacity of 70 tons per day—the smaller handles 35 tons. Neither pose a dust problem to plant or community, because both are equipped with a Type N ROTO-CLONE.*

High temperature gases and heavy concentrations of coarse and fine particles are invariably associated with rotary kiln operation—and air pollution problems. And that's where the Type N comes to the rescue! This hydro-static precipitator is unaffected by high temperatures; offers high

collection efficiency on even small micron particle sizes. When bulk of material is needed dry, as at Westvaco, the ROTO-CLONE is an excellent final cleaner to dry type collectors. Small space requirements, constant exhaust volume and reasonable maintenance are other features recommending the Type N ROTO-CLONE for rotary kiln service.

Write for Bulletin No. 277 today! Remember, it costs less to build goodwill than to battle dust complaints.

*ROTO-CLONE is the trade-mark (Reg. U. S. Pat. Off.) of the American Air Filter Company, Inc., for various dust collectors of the dynamic precipitator and hydro-static precipitator types.



Type N ROTO-CLONE with hopper designed for sluicing collected material to process or disposal points.



American Air Filter
COMPANY, INC.

258 Central Avenue, Louisville 8, Kentucky
American Air Filter of Canada, Ltd., Montreal, P. Q.

When inquiring check CP 5681 on handy form, pgs. 2-3

NEW SOLUTIONS of processing problems

(Continued from page 16)

tower, as shown in photographs. Temperature of feed stock, which runs 290 to 325°F at atmospheric pressure, is measured at this point.

Gland consists of stainless steel cap and body, porcelain insulators, and Neoprene, Teflon, or powdered talc furnished as standard sealants. Sealant in gland is compressed between two porcelain

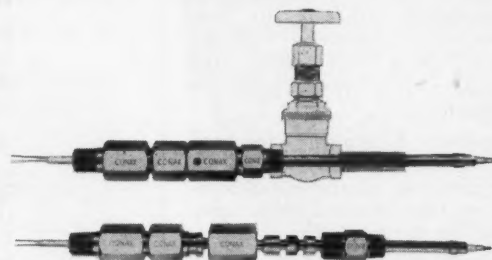


Gland (arrow) is used with gate valve, facilitating removal of thermocouple wires

insulators under a pressure of 50,000 to 100,000 psi. This is made possible by high degree of confinement of sealant. Although most users of gland are working at or near atmospheric pressures, construction of device which causes sealant to be forced against wire makes it possible to seal test pressures as high as 15,000 psi. In this way a positive seal is assured.

Glands may also be used at temperatures ranging from ambient to over 1500°F.

Key prevents gland follower from turning and causing twisting of the wires during assembly. Design of keyway allows some freedom of rotary motion in the gland follower. This permits easy disassembly of units for changing wires. Immersion depth of the hot junction is readily adjusted.



Upper illustration shows thermocouple gland, with gate valve and nipple in phantom view.

Lower illustration shows thermocouple sealing portion closed (left) and an exploded view of packing gland section (right)

Addition of a gate valve to system makes it possible to remove and re-insert thermocouple for checking or replacement without loss of pressure on the system. As shown, gland is installed in conjunction with valve at Taylor Oil and Gas Co.

Results: Since thermocouple gland was placed in operation, it has performed satisfactorily with no maintenance required. It has provided a positive seal for the bare thermocouple wires, permitting rapid and accurate temperature measurements.

(Thermocouple gland is product of Conax Corporation, Dept. CP, 4515 Main St., Buffalo 21, N. Y. . . . check CP 5682, pages 2 and 3.)

NEW SOLUTIONS of processing problems

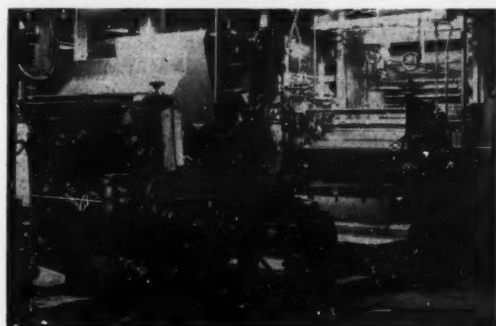
Control of adhesive's viscosity keeps coated abrasive line running smoothly . . .

ultrasonic instrument controls viscosity, opens and closes valve in diluting water line

Problem: Water-soluble adhesive is used in manufacture of coated abrasives at the Coated Products Division of The Carborundum Company, Wheatfield, N.Y. The adhesive is automatically and continuously applied to paper cloth, vulcanized fiber and combination backings onto which is spread the abrasive grains. (Pages 70 and 71 of the September 1952 issue of *CHEMICAL PROCESSING* describe process and its use of beta-ray gages.

During the course of the day, the adhesive would thicken as water evaporated (solution is kept warm). As this happened, adhesive weights would increase, and the coating machine couldn't continue to brush

(Continued on next page)



Carborundum abrasive paper is made automatically and continuously on this machine. Viscosity of adhesive used for bonding grains to paper backing is held constant by automatic instruments in this installation



Computer of ultrasonic viscosity indicator and controller is at top of tall; large dial underneath indicates adhesive viscosity. Recorders to left are part of thickness-monitoring system which operates from beta-ray gages at various points in process

Hard rubber lined chlorine gas coolers



don't give **CORROSION** an inch . . .

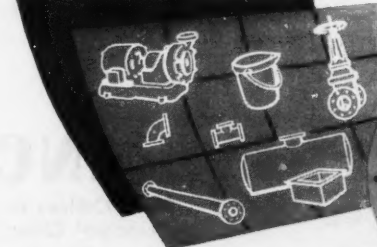
. . . IT MAY TAKE A mile

Ever stop to think how much of your plant could be taken out of service by a pinhole failure in a vital fitting, tank, or valve? The average pump failure, for example, was found to cost \$125 according to one survey. We know of cases where more than a mile of piping and equipment has shut down when corrosion struck one small, unprotected spot.

In Ace hard rubber protected equipment there are no loopholes for pinholes. The protection you buy gets 20 rigid inspections, developed through 100 years of experience with this finest of corrosion-resistant materials. In one test, a piece from the same batch of rubber, bonded and vulcanized at the same time as the lining, goes to the laboratory for complete breakdown analysis just to make sure.

Many types of Ace rubber and plastic materials are available in a wide variety of standard or special equipment for complete chemical processing, storage or circulating systems. Write for bulletins.

more RESISTANT
TO more CHEMICALS

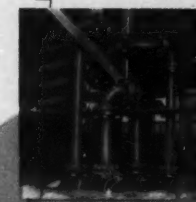


ACE® rubber and plastic products

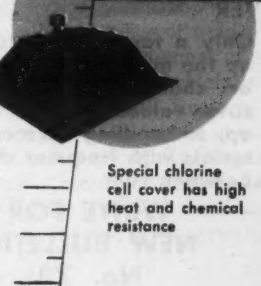
AMERICAN HARD RUBBER COMPANY
93 WORTH STREET • NEW YORK 13, N. Y.

When inquiring check CP 5683 on handy form, pgs. 2-3

Hard rubber pipe and fittings handling zinc chloride



Special chlorine cell cover has high heat and chemical resistance





Introducing THE RAY-DUCER

A NEW LINE OF RAYMOND PULVERIZING MILLS WITH SCREEN SEPARATION



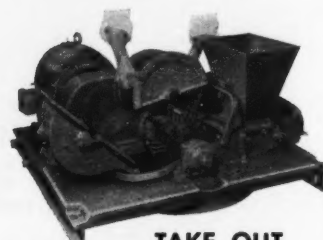
LIFT
COVER

Only a few seconds to open up the mill for quick cleaning or changing screens. This saves valuable time in setting up, or handling different materials with frequent changes between runs.

WRITE FOR
NEW BULLETIN
No. 73
Now Ready



TILT CARRIER



TAKE OUT
SCREEN UNIT

THESE modern RAY-DUCER Mills are a new addition to the well known Raymond pulverizing, air-separating and flash drying systems.

They are especially designed for grinding or disintegrating a wide range of medium soft materials to specified screen fineness where moderate capacities are required.

Their high-speed hammer action reduces the material rapidly to a uniform powdered product at exceptionally low cost and insures a consistent finished material suitable for special chemical and manufacturing processes.

Raymond RAY-DUCERS offer many advanced features, as well as new ease of control, simplicity of operation, and quick accessibility of interior parts.

If you have a grinding problem, the RAY-DUCER may be an economical solution . . . write for details and tell us your requirements.

COMBUSTION ENGINEERING, INC.
Raymond Division
1317 No. Branch St., Chicago 22, Ill. Sales Offices in Principal Cities

When inquiring check CP 5684 on handy form, pgs. 2-3

NEW SOLUTIONS of processing problems

(Continued from preceding page)

out the glue in an even layer. Then, the complete line had to be shut down while the adhesive's viscosity was adjusted.

Solution: Glue viscosity is now being monitored and controlled. An instrument working on an ultrasonic principle (the Ultra-Viscoson) measures the viscosity and opens a diaphragm valve in diluting water line each time adhesive reaches a pre-determined viscosity. Control action is not simple on-off type; it modulates continuously.

Hermetically sealed probe of unit is in adhesive-recirculating line. This probe is vibrated in the ultrasonic range, and its actual vibration in its surrounding medium is a measure of the viscosity of that medium. The signal is transmitted to the computer of the unit, where it is converted into a viscosity indication and is amplified to supply the control action to the air-operated diaphragm valve.

Results: Now that thickness, or viscosity, of adhesive is continuously controlled, coating machine always applies an even coating. Shutdowns for adjusting viscosity have been virtually eliminated.

(The Ultra-Viscoson is being made by Cincinnati Division, Bendix Aviation Corporation, Dept. CP, 203 W. Third St., Cincinnati 2, Ohio . . . or for more information reader may simply check CP 5685 on the convenient Reader Service slip located between pages 2 and 3.)

Measuring resin input saves material cost, ups quality . . .

instruments check paper base weight and impregnated weight to give resin pickup

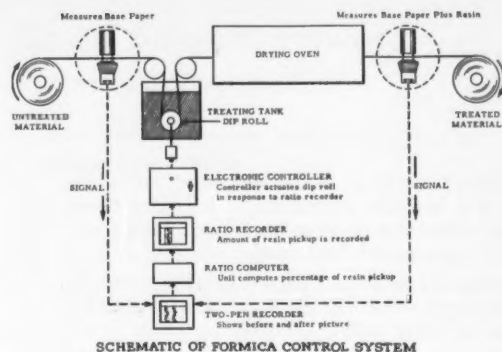
Problem: Formica Company of Cincinnati, well-known for laminated building materials, had a long-standing problem. Like other manufacturers whose product is handled as a moving web, their difficulty was in maintaining quality control because of sampling drawbacks. Base paper traveling at 100 fpm was dipped in resin and oven dried. Both base paper and impregnated paper were sampled manually by cutting pieces from passing web.

To be sure that minimum specs were being met with this hit-and-miss sampling method, specs were often overshot. There was the attendant non-uniformity, material waste, and delay in re-establishing optimum settings when an upset was found.

Solution: This was an obvious case for the application of beta ray gaging equipment. But the system installed at Formica was more comprehensive than the usual control setup.

First of its type in the industry, system integrates two beta ray gages into impregnation line. Equally important are a ratio computer and an automatic electronic proportional controller. Gages

NEW SOLUTIONS of processing problems



measure paper base weight and impregnated weight. They also automatically compensate for temperature changes, humidity, dust, etc.

In each gage a sealed capsule of strontium 90 emits beta rays which travel through sheet. Rays are collected and measured for intensity by an ionization chamber above web. Because amount of radiation received by these chambers is inversely proportional to weight of material between source and chamber, gages are calibrated directly in weight per unit area.

At Formica, one gage was placed just before base paper was given its resin dip. Another checks weight after impregnated paper has left oven. Readings are recorded by a two-pen instrument and voltages proportional to readings are fed into a computing circuit. Computer's output (per cent resin pickup) is recorded on another instrument.

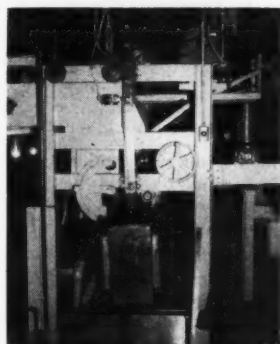
Controller is also actuated by computer's output when resin pickup approaches high or low limits. Output of controllers drives a motor which raises or lowers immersion roll in the resin bath—thus controlling resin pickup.

Results: First effect of new system

was an immediate reduction of tolerances to just over 2% — and further reductions are contemplated. According to Formica, it is now possible to produce impregnated paper of nearly perfect uniformity. Specification changes can be made more rapidly, and production is speeded up.

Officials say savings in resin alone will pay for installation in a year.

(AccuRay control system was designed and engineered by Industrial Nucleonics, Dept. CP, 1205 Chesapeake Ave., Columbus 12, Ohio . . . check CP 5686, pages 2 and 3.)



Close-up of treating tank dip roll, final control element in maintaining resin pickup constant



consider:

Corrosion Resistance and Heat Treatment

The best stainless tubing for a specific application cannot be identified by surface appearance alone. The answer is found in the grain structure. Because your guarantee of satisfactory service rests *inside* the metal, it is most important for the stainless tubing buyer to consider his supplier's methods of manufacture.

Corrosion resistance of any given grade of stainless steel, depends upon heat treatment. Heat treatment of

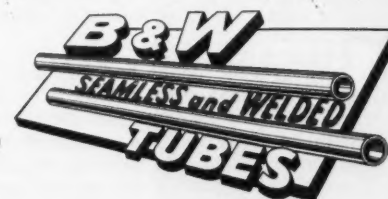
stainless steel tubing for a specific end use may vary according to grade, size of tube and service requirements involved. For instance, the austenitic grades of stainless steel have optimum corrosion resistance only when all carbides have been dissolved and retained in solution by rapid cooling. At B&W, heat treatment is rigidly controlled, and every piece of stainless tubing is heat treated to provide optimum corrosion resistance when

that property is required.

For virtually any application—pressure or mechanical—B&W can provide either seamless or welded stainless tubing in any number of grades, in a broad size range. Help is available through B&W Regional Sales Offices and a nationwide network of experienced tubing distributors. Mr. Tubes—your link to B&W—will be pleased to furnish detailed answers to your stainless tubing problems.

**THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION**

Beaver Falls, Pa. — Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio — Welded Carbon Steel Tubing



When inquiring check CP 5687 on handy form, pgs. 2-3

TA-1813(H)

materials



Thin coating with water and bake after applying

IT'S WATERPROOF!

Phenolic base resin looks good for metal coating — resists corrosion, oils, solvents, and is flexible enough so that metal can be deep drawn

Enamels, lacquers, and varnishes which can be thinned with water are now being made. Water-soluble, plasticized phenolic resin which makes this possible is called Hydrophen. New material seems to offer both new techniques and new economies. Aside from novelty value of thinning coatings with water, need for costly, toxic, or flammable solvents is eliminated.

Hydrophen itself is made up of 3 components: a phenol alcohol synthesized from carbolic acid and formaldehyde (to impart hardness and abrasion-resistant qualities), an alkyd resin (adds flexibility and prevents cracking), and ammonia. It is the ammonia which is responsible for making the material completely water soluble. These three yield a homogeneous, film-forming composition.

Thinned with tap water, coating may be applied directly to metallic surfaces as a clear finish. It may also be pigmented to produce colored enamel. After application water is allowed to evaporate. When heat is applied, finished coating is water-resistant, weather-proof, and resistant to oils, corrosion, and solvents. It is also flexible enough to allow deep pressing and stamping.

Characteristics

Wetting and flow characteristics are good. This is true both in the original acid state of the material, when diluted with organic solvents; and in the neutralized state when diluted with water or a mixture of water and water-miscible organic solvents. Even when the film is pigmented, good film properties are obtained. Film also retains its flexibility even when it is purposely overcured.

Cured coating has been found to possess excellent resistance to water and acids, but its resistance to alkali is somewhat limited. Although alcohols, esters, and aromatic solvents exert swelling action on cured films, injury is not permanent. Coatings are not attacked by gasoline, mineral or vegetable oils.

Coating is compatible with other types of coatings. It may be top coated with enamels based on oil, alkyd, urea, or melamine. Discoloration results if

Hydrophen is stored in unlined steel containers (even if it has been neutralized). It is best stored in glass containers or resin-lined steel drums, aluminum, or galvanized sheet metal.

When Hydrophen is too diluted with water, it should be neutralized before the dilution. Water solubility is achieved when added ammonia or amine is insufficient for complete neutralization. Neutralization can be followed using bromthymol blue as an indicator — not enough ammonia is used to produce noxious fumes. Where low viscosity is required it is advisable to use, in addition to the water, a small quantity of glycol ether.

HYDROPHEN SPECIFICATIONS

Non-volatile	75-76%
Solvent	Mixture, water & water-miscible solvents
Acid number	50-60
Solubility	Water, alcohols, glycol ethers, other water-miscible solvents

Although phenol alcohols contained in the coating are intrinsically unstable (even at room temperature they slowly advance in molecular size and become less water-soluble), Hydrophen has a useful storage life of several months. After it has been neutralized with ammonia, however, storage life is reduced to several weeks.

Application Methods

Coating can be applied by spraying, dipping, roller-coating or brushing. Metal, of course, should be completely free from oil and grease. This is especially important since surface must be capable of being completely and uniformly wetted by water. Degreasing agents or water-miscible solvents are the best means of preliminary cleaning.

Coating is baked at a temperature of 320-390°F over cycles of 15-45 minutes. Where shorter times are desired temperatures above 390°F can be used. With infrared, for instance, a radiation temperature of 430-460°F at an object temperature of 280-320°F with a retention time of 8-12 minutes is recommended.

A longer period of flash drying must be allowed for water diluted coating than is allowed for coatings thinned with volatile solvents. Evaporation of water can be stimulated by forced draft ventilation and elevated temperature. Compensation for this is the fact that solvent recovery is not a factor, nor are toxic or flammable fumes.

(Hydrophen is a product of Reichhold Chemicals, Incorporated, Department CP, 630 Fifth Avenue, New York 20, New York . . . or for more information check CP 5688 on handy Reader Service slip located between pages 2 and 3.)

Good Solvent Power

For series of aromatics

Uses seen in paints, insecticides, herbicides, other fields

Six aromatic petroleum solvents recently announced are characterized by their good solvency power. All grades are adapted to specific uses in the paint industry. Some are active solvents, being suitable for applications in the insecticide and herbicide fields.

Properties of Nevsolv B and T, which are recommended for paint and varnish removers and as lacquer diluents, follow:

Nevsolv B

Property	Typical Inspection
Sp gr, 15.6/15.6°C	.796
API gr, 60°F	45
Color, ASTM D 156-49	30
Copper strip corrosion	Neg
Kauri-butanol value	80
Aniline point (mixed)	27°C
Distillation range	60-106°C

Nevsolv T

Property	Limits
Sp gr, 15.6/15.6°C	.828-.840
API gr, 60°F	37-39
Color, ASTM D 156-49	Not less than 21
Corrosion	Copper strip shall not show iridescence nor a gray or black deposit or discoloration
Kauri-butanol value	not less than 82
Aniline point (mixed)	Not greater than 24°C
Distillation range	100-130°C

Nevsolv H, HF, and 30 are suggested as paint and varnish thinners among other applications. Properties of these grades:

Nevsolv H

Property	Limits
Sp gr, 15.6/15.6°C	.835-.850
API gr, 60°F	35-38
Color, ASTM D 156-49	Not less than 5
Corrosion	Neg
Kauri-butanol value	Not less than 60
Flash point	Not less than 95°F
Aniline point (mixed)	Not greater than 38°C
Distillation range	145-200°C

Nevsolv HF

Property	Limits
Sp gr, 15.6/15.6°C	.835-.850
API gr, 60°F	35-38
Color, ASTM D 156-49	Not less than 21
Copper strip corrosion	Neg
Kauri-butanol value	Not less than 60
Flash point	Not less than 100°F
Aniline point (mixed)	Not greater than 38°C
Distillation range	148-200°C

(Continued on next page)



Volume buyers of

SURFACE ACTIVE AGENTS!



It will pay you to investigate

ORONITE
ALKANE

the basic raw material used
in making a variety of
detergents and wetting agents

If you are a large user or seller of surface active materials, it will pay you to talk over sulfonation with us. It could be more profitable for you to start with the base raw material, Oronite Alkane, and produce your own surface active agents.

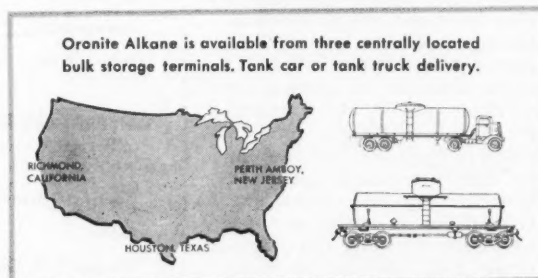
1. Oronite Alkane is the principal and basic material used in sulfonating a great variety of the highest quality synthetic detergents and wetting agents. Because Oronite is the world's largest producer of

synthetic detergent raw materials, we can offer you assured supply on consistently high quality Alkane.

2. We have the experience, *plus* engineering and manufacturing specialists to accurately estimate your complete needs for sulfonation. Plant designs, equipment needs and prices, performance data, yields—everything you need to know. You may find the sulfonating process a lot less costly than you think. Why not talk it over? Write or phone the Oronite office nearest you and we will have a detergent engineer contact you.

OTHER ORONITE DETERGENT PRODUCTS

Detergent Slurry • Detergent D-40 • Detergent D-60
Dispersant NI-W • Dispersant NI-O • Wetting Agents



ORONITE CHEMICAL COMPANY

38 Sansome St., San Francisco 4, Calif. • Standard Oil Bldg., Los Angeles 15, Calif.
30 Rockefeller Plaza, New York 20, N.Y. • 600 S. Michigan Ave., Chicago 5, Ill.
Mercantile Securities Building, Dallas 1, Texas



When inquiring check CP 5689 on handy form, pgs. 2-3

MATERIALS

(Continued from preceding page)

Nevsolv 30

Property	Limits
Sp gr, 15.6/15.6°C	.835-.845
API gr, 60°F	36-38
Color, ASTM D 156-49	Not less than 21
Copper strip corrosion	Neg
Kauri-butanol value	Not less than 71
Flash point	Not less than 80°F
Aniline point (mixed)	Not greater than 30°C
Distillation range	130-190°C

In addition to paint applications, preceding Nevsolv 30 and following Nevsolv 200 are active solvents for DDT, BHC, 2-4-D esters, making them adapted to the insecticide and herbicide fields. Properties of Nevsolv 200:

Nevsolv 200

Properties	Limits
Sp gr, 15.6/15.6°C	.890-.915
API gr, 60°F	23-27.5
Color	Straw
Kauri-butanol value	Not less than 67
Flash point	Not less than 175°F
Aniline point (mixed)	Not greater than 42°C
Distillation range	195-280°C

At least one other cut will shortly be available. In many cases, special boiling ranges to meet individual requirements can be furnished.

(Nevsolv solvents are product of Neville Chemical Co., Dept. CP, 1938 Neville Island, Pittsburgh 25, Pa. . . . or for more information check CP 5690 on handy form, pages 2 and 3.)

Plastic molder eliminates residual styrene smell in tote boxes . . .

polyester resin used to form odor-free, smooth, reinforced product, unaffected by 260°F

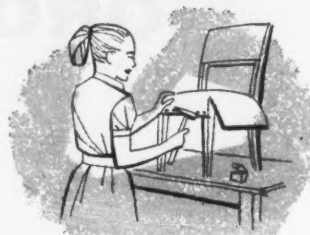
Problem: Candy maker couldn't use Fiberglass-reinforced plastic tote boxes molded by a Philadelphia firm, because residual styrene odor passed into candy. However, reinforced plastic was almost a "must" for this application because of its light weight, impact resistance, ease of cleaning, and corrosion resistance.

Solution: Molder tried to eliminate odor by using several different polyester resins, but had little success until he tried one called Atlac 382. This polyester is a dry powder and is stable in storage. The resin is first dissolved in styrene, after which a catalyst is added and the mix poured onto the glass-fiber reinforcing mat. Then, material is heated for three minutes between metal platens to effect complete cure.

Results: Tote boxes made by the method described above show total absence of styrene after-odor. They successfully passed a test of being locked up with butter for a day to find out if the butter picked up off-taste. In previous tests, it was not even necessary to taste the test butter,

for your information...

brief summaries of helpful product news



Two New Plasticizers Added to Monsanto Line

Two low-temperature plasticizers for polyvinyl chloride resins are now available in commercial quantity from Monsanto.

The products, additions to the company's wide range of plasticizers, are Di (2-ethylhexyl) adipate (DOA) and Di-n-octyl, n-decyl phthalate (DNODP).

DOA imparts excellent low-temperature flexibility as well as heat and light stability, and is extremely useful for controlling the viscosity of plastisols. It is recommended for use with polyvinyl chloride garden hose, film and fabric coatings. It is also effective in vinyl plastisols for toys, footwear, sponge and other products.

DNODP is recognized as the most economical quality plasticizer for obtaining good low-temperature flexibility, low volatility, good heat and light stability and water resistance. It also imparts excellent viscosity characteristics to plastisols. DNODP is especially useful in vinyl film and sheeting for upholstery and draperies, fabric coatings and garden hose. It results in up-graded products with good flexibility and permanence and resistance to soapy and boiling water.

These two products can be supplied in drums or tank cars and, where feasible, in tank truck quantities. For more information, send coupon.

Ortho-Nitrochlorobenzene Has Wide Number of Uses

ONCB—ortho-nitrochlorobenzene—is sometimes called "an intermediate's intermediate" because of its versatility and high reactivity in the production of many derivatives which serve as intermediates.

It can be used in reduction, ammonolysis, hydrolysis, nitration and ether synthesis. These varied reactions make it extremely useful in the production of intermediates for a wide variety of industries.

Dyes, sulfa drugs, medicinals, mildew-proofing agents and photographic developers are all made from intermediates pro-

duced with the help of ONCB. Perhaps this versatile compound can help your product or process. Mail the coupon for more information.

Benzoic Acid (Technical) Widely Used by Industry

Benzoic acid (technical) is supplied by Monsanto as a white powder which assays 99.0% minimum. This versatile compound has numerous applications.

Benzoic acid is used in the manufacture of benzoates and benzoyl compounds. It acts as an intermediate in the production of dyes; as a mordant in calico printing; as a dispersing agent in the grinding of pigments.

One of the most recent applications of benzoic acid is as a carrier in the dyeing of "Dacron," polyester fiber.

Monsanto would welcome specific inquiries on benzoic acid and its present uses, possible future applications and reactions. This product offers a wide field for experimentation and development. Experimental samples will be made available to qualified chemists.

For a copy of bulletin on dyeing of "Dacron," send the coupon.



Research Chemist's Corner

Can This Compound Improve a Product or Process for You?

TRIETHYL THIONOPHOSPHATE

Formula: (C₂H₅O)₃PS

Mol. Wt.
198.22

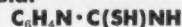
Approximate Properties

Appearance:	Clear, colorless to straw-colored liquid
Boiling Point:	100° C. at 16 mm. Hg. 216° C. at 745 mm. Hg. (decom.)
Crystallization Point:	approx. 2.1° C.
n _D ²⁵	1.447
Specific Gravity:	1.064 at 25°/25° C.
Odor:	Characteristic strong odor
Wt. per U. S. Gallon:	8.9 at 25° C.
Surface Tension, dynes/cm.:	29.65 at 20° C.
Solubility:	Soluble in benzene, heptane, carbon disulfide, carbon tetrachloride, ethanol, methanol, acetone, ethyl ether, ethyl acetate. Insoluble in water.

Pilot plant quantities available.

2-Mercaptobenzimidazole Available

Formula:



As part of its program of developing new chemicals for industry, Monsanto is offering another compound which shows good potential for future development.

Research quantities of 2-mercaptobenzimidazole are now available from Monsanto. This compound with a molecular weight of 150.19 is soluble in alcohol, ethyl acetate and acetone. It is insoluble in other common organic solvents and has a melting point of 295-300°C. It has the appearance of pearly flakes.

For a technical data sheet on this product, send in the coupon.

Samples available to qualified research organizations.

Methyl Salicylate Masks Odors

An effective use of versatile methyl salicylate is its application as an odorant and masking agent in glues used on gummed tape.

The addition of small quantities of this product masks unwanted odors and replaces them with a pleasant, appealing scent.

For information on this application mail in the coupon.

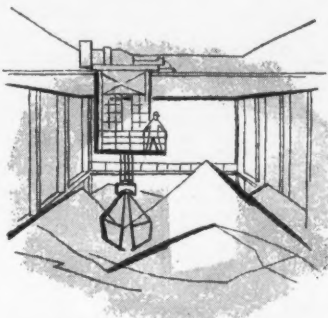
New Bulletin on Masonry Paint Formulating

A completely revised bulletin, recently published by Monsanto, will act as guide in formulating a variety of finishes using Pliolite** and Monsanto Aroclors.* These finishes include exterior types for poured concrete, cinder blocks, asbestos cement shingles, stucco, brick and similar masonry surfaces. High styrene-butadiene copolymer resins formulated with Aroclors make excellent paint vehicles and are also easy to formulate.

The bulletin describes general physical and chemical characteristics of the Aroclors and the general properties of Pliolite S-5 Resins. This material is followed by several sections which cover grinding, mixing, formulating and other valuable manufacturing information for those in the surface coating field.

For your copy of this Bulletin No. P-126, entitled "Aroclors in Formulating High Styrene-butadiene Copolymer Surface Coatings (Pliolite S-5 Resins)," send in the coupon.

Similar information is available on Marbon† 9200 resin, high styrene-butadiene formulations. Send for bulletin P-149.



Wetting Agent Aids Making of Superphosphate

Manufacturers of superphosphate have a new and extremely valuable processing aid—Sterox* AJ.

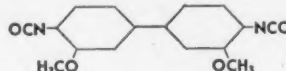
This wetting agent added to the acid during manufacture reduces surface tension and makes certain the acid will mix and react with the phosphate rock much more quickly than would otherwise be possible. This helps to assure a more complete reaction between the ingredients.

These advantages mean that users of Sterox AJ for superphosphate manufacture get a product which cures quickly and is free of hard, troublesome lumps.

Sterox AJ is particularly suited for this application because of

its solubility in acid and excellent stability.

For more complete information on this new development, send in the coupon.



Dianisidine Diisocyanate Now Available

Continuing its program of steady growth and expansion to meet the increasing demands of industry for isocyanates, Monsanto has now made available in commercial quantities another new product, dianisidine diisocyanate.

This new compound will undergo all of the diisocyanate reactions. It has been developed because a high melting product is often needed in foams, elastomers, and other diisocyanate-polyester products.

Dianisidine diisocyanate joins Monsanto's large and growing family of isocyanates now being used in such applications as adhesives, polyester rubber, foamed-in-place resins, flexible foams and surface coatings.

For technical data sheet on this product mail in the coupon, now.

*Reg. U. S. Pat. Off.

**Trade Name Reg. U. S. Pat. Off. Goodyear Tire & Rubber Co.

†Trade Name Reg. U. S. Pat. Off. Marbon Corp.

‡Trade Name Reg. U. S. Pat. Off. E. I. du Pont de Nemours & Co., Inc.



MONSANTO CHEMICAL COMPANY
1702 South Second Street, St. Louis 4, Missouri

Please send information on:

- ☐ DOA
☐ DNODP

☐ Methyl Salicylate for Adhesives

Please send:

- ☐ Literature on Sterox AJ as used in superphosphates
☐ Data sheet on dianisidine diisocyanate
☐ ONCB Bulletin
☐ Marbon Bulletin P-149
☐ "Dacron" Dyeing Bulletin
☐ Data sheet 2-Mercaptobenzimidazole
☐ Data sheet Triethyl Thionophosphate
☐ Aroclors Bulletin P-126

Please send samples:

- ☐ 2-Mercaptobenzimidazole
☐ Triethyl Thionophosphate

Name Title

Company

Street

City Zone State

When inquiring check CP 5691 on handy form, pgs. 2-3

since smell on opening the container was enough evidence to indicate failure. New boxes are completely acceptable by the candy manufacturer.

Other advantages are high heat-distortion temperature (260 to 275°F), and smooth surface. Atlac 382 shows pronounced wetting action on glass fiber, and this helps to produce a smooth exterior, with the glass fiber pattern well hidden.

Success of above application appears to recommend this polyester resin for use in refrigerators where, despite the reduced temperature, fat foods are prone to absorb objectionable styrene odor. The stable powder form of the resin helps in assuring uniformity of cure.

(Atlac 382 is a development of Atlas Powder Company, Dept. CP, 904 Market St., Wilmington 99, Del. . . or for more information check CP 5692 on handy Readers Service slip located between pages two and three.)

No dusting when seeds are treated with disinfectant

Dusting problems while treating seed or handling it afterwards are reported to be virtually eliminated with a double strength (7.7%) ethyl mercury seed disinfectant recently announced. Named Ceresan M-2X, the product is applied in a liquid mixture or slurry which quickly dries on the seed without "dusting off" during the treating operation, or later when the seed is bagged and handled.

Disinfectant is recommended for control of seed-borne and soil-borne organisms which attack wheat, rye, barley, oats, sorghum, cotton, and flax. Among the diseases it controls are: covered smut, black loose smut, and stripe of barley; oak smuts; stem and covered smuts of rye; loose and covered smuts of sorghum and stinking smut and kernel smudge seedling blight of wheat. It is also said to reduce infections from anthranose and angular leafspot of cotton.

(Product of E. I. du Pont de Nemours & Company, (Inc.), Dept. CP, Wilmington 98, Delaware . . . or for more information check CP 5693 on handy form, pages 2 and 3.)

More info given on labels for ion exchange resins

Latest wrinkle in labeling ion exchange resins should help research workers attempting to apply the resins to a wide range of projects. Labels include trademark and resin number, mesh size, type of resin, porosity, type of matrix and functional group, form of resin, total capacity, moisture content, patent number, lot number, order number, date, and net weight.

(Dowex resins are made by The Dow Chemical Company, Midland, Mich.)

PERMAGEL

...a new bodying agent with uniquely different properties



New Ideas...

...you may find them in this new bulletin. It discusses composition, properties, advantages and applications of Permigel. Ask for Bulletin P-53.

There's no getting around it—Permigel can benefit you if your procedure involves the bodying of aqueous, organic or emulsion systems.

VERSATILE—Permigel functions as a bodying, thickening, gelling, and suspending agent; as stabilizer, strengthener.

FLEXIBLE—Permigel will yield gel structures that show high stability (even in the presence of electrolytes), that are thixotropic, and that are controllable with respect to gelling rate, viscosity or consistency. It will body most organic media, including some that heretofore have proved difficult to gel.

ECONOMICAL—Permigel's needle-like particles so closely approach the ideal for

forming controlled gel structures, that a relatively small amount produces the desired system—an economy furthered by its low initial cost.

MORE GOOD POINTS—Permigel is highly sorptive, grit free, easy to disperse, capable of buffering, light cream in color, dry, free-flowing, trouble-free to store or handle.

Permigel has moved into a varied circle of proposed uses: inks, paints, polishes, waxes, cosmetics, pharmaceuticals, resins, adhesives, textiles and papers—to mention a few.

How can you use Permigel's bodying properties to advantage, and how can we help you to do so? May we send you a free sample and our new bulletin P-53 as a starter?

ATTAPULGUS Minerals & Chemicals Corporation

DEPARTMENT B

210 WEST WASHINGTON SQUARE, PHILADELPHIA 5, PA.

When inquiring check CP 5694 on handy form, pgs. 2-3



MATERIALS

Highly soluble organic sequestrants for divalent metal, ferric ions

Uses: Products sequester divalent metal and ferric ions over a broad pH range. Preferential chelation of divalent ions and high water solubility of chelates give products many applications in textile, soap, and chemical plants.

Features: Products have detergent-building properties when added to soap and synthetic detergents. Chelates are not precipitated by soaps, oxalates, and phosphates.

Description: Perma Kleers are stable salts of polyamino carboxylic acids.

(Products of Refined Products Corporation, Dept. CP, Lyndhurst, N. J. . . or for more information check CP 5695 on handy form, pages 2 and 3.)

Ethyl acetoacetate's role in drug and dye fields

Physical and chemical properties, uses, and potential applications of ethyl acetoacetate are described in 4-page technical bulletin. Compound is employed in pharmaceutical and dyestuff industries and derivatives are used in manufacture of paint, lacquer, and printing inks. An intermediate in synthesis of Hansa dyes and azo dyes of the pyrazolone series, it is also used in preparing synthetic anti-malarial compounds, anti-neuritic vitamin B₁, antipyrine, and amidopyrine.

Bul F-8292 is issued by Carbide and Carbon Chemicals Co., a div. of Union Carbide and Carbon Corp., Dept. CP, 30 East 42nd St., New York 17, N. Y. When inquiring specify CP 5696 on handy form, pages 2 and 3.

Wood gluing production up 25% using liquid urea resin . . .

bonds last longer with urea-melamine combines

Uses: Recommended for gluing operations requiring urea resin formulations, as in plywood and furniture industries.

Features: Adhesives are said to have high rate of reactivity, particularly in hot press operations. It is reported that cycles have been obtained in such operations which are faster than those ever before achieved with this type of resin. Average production increases of 25% have been reported.

Description: Lauxite UF-101 and Lauxite UF-112 are liquids and contain 60% and 65% solids, respectively. Maker especially recommends use in urea-melamine combinations. They are reported to impart improved durability to such mixtures as measured by boil resistance. Stability under normal storage conditions is good.

(Product of Plastics Division, Monsanto Chemical Co., Dept. CP, Springfield, Mass. . . or for more information check CP 5697, pages 2 and 3.)

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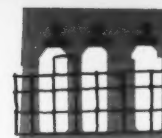
VICTOR

Dependable Name in
Chemicals
for 56 Years

DISODIUM PHOSPHATE, DUOHYDRATE

Anhydrous disodium phosphate is a white, crystalline material of food grade purity. Also available, disodium phosphate duohydrate, a white, crystalline material which complies with Food and Drug Laws in purity.

USES: Boiler water treatment. Tin weighting of silk. Textile process waters. Buffer in dye-baths. Casein emulsifier. Processing of cheese. Manufacture of pharmaceuticals, and evaporated milk. Pumping pickle for canned meats.



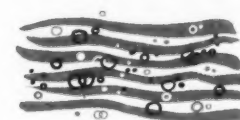
A Phosphate Makes the Difference

A baby's appetite demands only one food . . . milk. As a substitute for mother's milk, many doctors recommend a formula based on evaporated milk. The creamy, uniform quality of evaporated milk is made possible with the use of an emulsifier, disodium phosphate. Victor is proud to produce this phosphate that meets the high purity and uniform quality standards required by the industry. Disodium phosphate also finds wide application in the production of process cheese. It pays to see Victor.

SODIUM TRIPOLYPHOSPHATE

Sodium tripolyphosphate anhydrous, powdered or granular.

USES: Soap builder. Manufacture of detergents and water softeners. Purification of china clay. Conditioning oil drilling muds. Particularly effective in bar soaps; will not crystallize nor bloom. Disperses soap curds in hard water and eliminates scum. Clay dispersant. Deflocculant in raw cement slurries. Anti-pitch agent in paper making.



A Clean Story

Combine soap and hard water and you are asking for trouble! Soap plus hard water produces insoluble curds. These curds cause "tattle-tale gray" and in time they tend to "gum up" washing machines. Victor is proud of the important role that its phosphates have played in the development and growth of detergents. Victor sodium tripolyphosphate and tetrasodium pyrophosphate are well known by builders of detergents for their ability to produce a sweeter, cleaner, whiter wash. It pays to see Victor.

PLANT FOOD COMPOUND

Take-Hold® is a combination of pure, crystalline ammonium and potassium phosphates, completely soluble in water, giving a substantially neutral solution.

Typical analysis: N 10%
P₂O₅ 52%
K₂O 17%

USES: Starter solution and plant food for tomatoes, tobacco, cabbage, eggplants, floral plants, etc. Produces earlier fruiting and larger yields.



How to Get a Head Start

With home gardeners the motive is pride! With commercial growers, it's profit. But both delight in harvesting a bumper crop ahead of competition. And both accomplish this objective when they use Victor's "Take-Hold" . . . the special plant food that produces a head of cabbage fast and speeds early yields of tomatoes, cauliflower and other crops grown from transplants. Take-Hold is widely used by both commercial and amateur gardeners for faster growth, greater yield, fewer plant losses. It pays to see Victor.

SODIUM ACID PYROPHOSPHATE

TRADE MARKS — Victor Cream, Perfection, B. P. Pyro

Victor sodium acid pyrophosphates are white powders whose purity meets the requirements of the Federal and State Pure Food Laws.

USES: Baking acid for doughnut flours, prepared flours. Manufacture of commercial baking powders, and baking creams. Conditioning oil well drilling muds. Acid type metal cleaner.



Here's Mud in your Oil Well

Custom-made mud for oil well drilling is almost worth its weight in gold. The mud washes the hole clear of cuttings and returns them to the top. It builds a protective wall against the side of the hole to guard against cave-ins and holds back gas pressures. To control mud viscosity, Victor sodium phosphates are added as needed. The oil industry is another field where Victor chemicals fill a need. It pays to see Victor.

PHOSPHORUS OXYCHLORIDE

Phosphorus oxychloride is a water-white to slightly yellow liquid whose vapors are very irritating. It decomposes in water to yield phosphoric and hydrochloric acids, and is chemically very reactive.

USES: Intermediate in production of organic chemicals. Chlorinating agent. Catalyst.



From Phosphates to Pharmaceuticals

Phosphates have played an important role in the synthesis of many of the modern "miracle" drugs used today. For example, phosphorus oxychloride acts as an intermediate in the production of sulfa drugs and in the synthesis of atabrine, the anti-malarial specific. Two other Victor products play important roles in modern medicine development . . . phosphoric acid in the production of penicillin and formic acid in the production of new "allergy" drugs.

MONOCALCIUM PHOSPHATE, ANHYDROUS (Heat-treated)

TRADE MARK — V-90®

(U. S. Patents 2160700 and 2160232; Canadian Patents 388809 and 388810)

V-90 is a fine, white, free-flowing powder, each particle of which has a thin, continuous coating of a relatively insoluble phosphate which delays solution when aqueous liquids are added. This makes possible a delayed leavening action.

USES: Manufacture of self-rising flour, self-rising corn meal, pancake flour, prepared mixes, household baking powder, phosphated plain flour, and bakers' angel food cakes. As an ingredient of baking preparations. (U. S. Patents 2160700-1 and 2160232-3)

Light as a Bride's Biscuits?

In the South, especially, even a bride's biscuits are almost certain to be feather-light and tender. This is because most southern folks buy their flour with salt and special baking powder already mixed in by the miller. One of the ingredients is Victor's V-90 phosphate . . . the world's only slow acting monocalcium phosphate.

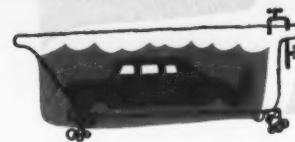
VICTOR
Dependable Name in
Chemicals
for 56 Years

PHOSPHORIC ACID

Phosphoric acid is a clear, colorless, sparkling liquid. All grades meet the requirements of the Federal and State Pure Food Laws.

Concentrations: 75%, 80%, 85% N.F.
115% (Polyphosphoric)

USES: Manufacture of yeast, sugar, soft drinks, imitation jellies, gelatin, and pharmaceuticals. Rustproofing, engraving, railroad car cleaning, refining oil and gasoline, preserving silage. Weighting silk, and dyeing textiles. Chemical polishing and electro-polishing metals, bright-dip baths for aluminum. Manufacture of phosphates, dental cements, glue, ceramics, glass, metal treating compounds, explosives, and fertilizers.



One Bath Lasts a Lifetime

The beauty and durability of metal products such as refrigerator shells, automobile bodies and the like, is due in part to a phosphoric acid bath given the metal just before paint is applied. This bath produces a rust-resistant coating on the shell that provides a better bond for the paint. Thus, blistering and chipping, due to an improperly prepared surface, is avoided. For years Victor has been the principal supplier of phosphoric acid to the metal industry. It pays to see Victor.

FLAMEPROOFING COMPOUNDS

TRADE MARKS

Fyrex®—a neutral ammonium phosphate.

Flexible Fyrex®—regular Fyrex to which a softening agent has been added.

Special Flexible Fyrex®—regular Fyrex to which a softening agent has been added, plus a penetrating agent.

USES: Flameproofing of textiles, paper, wood, and vegetable fibers. Applied to paper, fabrics, or insulating materials by dipping, spraying, or contact rollers; to wood under pressure in autoclaves.



Burning Question

Ammonium phosphates are among the most effective flameproofing agents known. Victor ammonium phosphates, as well as special compounds like the Fyrex Group and Victamide®, have found wide use in industry. Alert manufacturers seeking a new sales appeal for their products have found that flameproofing them with Victor's flameproofing agents turned the trick. Materials for insulation, paper, wood, and textile products are among the many items that lend themselves to flameproofing. It pays to see Victor.

plants and offices of VICTOR CHEMICALS



it pays to see

VICTOR

Dependable Name in
Chemicals
for 56 Years

VICTOR CHEMICAL WORKS

141 West Jackson Boulevard
Chicago 4, Illinois

Eliminates sticking of epoxy resins to molds

Sticking of epoxy resins to mold surfaces is reported solved by releasing agent. Previously, this difficulty was encountered after laminating or casting operations. Release agent may be used on metal or plaster molds. Mold is ready for resin application within a few minutes after agent has been applied. It is especially effective with low temperature setting, amine-hardening type epoxy.

Maker recommends that plaster molds should be impregnated, hardened, and sealed with a special furane resin impregnating agent before applying agent.

(Release agent H-561-B is product of Furane Plastics, Inc., Dept. CP, 4516 Brazil St., Los Angeles 39, Calif. . . or for more information check CP 5698 on handy form, pages 2 and 3.)

Guide for anhydrous ammonia

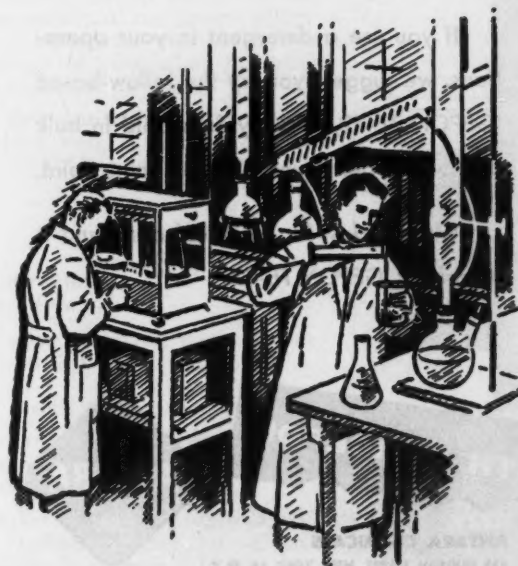
Illustrated 20-page manual describes physical and chemical properties, and specifications of anhydrous ammonia in cylinders. Principle applications, handling and operating techniques, and safety instructions are treated. Manual also gives detailed instructions on linking cylinders together to achieve most economical operating results. Charts, technical drawings and graphs are included.

"Guide to the Use of Anhydrous Ammonia" is issued by Nitrogen Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N. Y. When inquiring specify CP 5699 on handy form located between pages two and three.

For more information on product at left, specify CP 5700 . . . see information request blank between pages 2 - 3.

For more information on product at right, specify CP 5701 . . . see information request blank between pages 2 - 3.

HEYDEN FOR HEXAMINE



HEYDEN CHEMICAL CORPORATION

342 Madison Avenue, New York 17, N. Y.

CHICAGO • PHILADELPHIA • DETROIT
SAN FRANCISCO • PROVIDENCE

To the resin chemist, it's

HEXAMETHYLENE TETRAMINE

To the pharmaceutical chemist, it's

METHENAMINE

Other users prefer the shorter name Hexamine. Whatever your favorite name may be -- and there are many others -- you can depend on Heyden "Hexa" for top quality and uniformity. As a prime producer of both the pharmaceutical and industrial grades in large volume, Heyden has the "know-how" to meet your most exacting requirements.

U.S.P. Powder and Granular:

100, 50, 25 lb. fiber drums.

Technical Granular:

75 lb. multiwall bags,
100 lb. fiber drums.

Technical Powder:

50 lb. multiwall bags,
100 lb. fiber drums.

FORMALDEHYDE

N.F. Solution -- in tank cars, tank trucks, 475 lb. drums, 100 lb. carboys, and bottles.
37% Formaldehyde, Methanol-Free -- in tank cars and tank trucks.

PARAFORMALDEHYDE

U.S.P. X Powder and Flo Granules. 250, 100, 50 and 25 lb. fiber drums.

Serving Industry through Finer Chemicals

Benzaldehyde • Benzotones • Benzyl Chloride • Chlorinated Aromatics
Crescents • Formaldehyde • Formic Acid • Glycophosphates
Guaicols • Hexamethylenetetramine • Medicinal Colloids
Methylene Disulphide • Nicotinic • Paraformaldehyde
Parahydroxybenzoates • Penicillin • Pentaoxythiols
Propyl Gallate • Resorcinol • Salicylates
Sulfinic Acid • Streptomycin



NOW
a 26% active slurry form of **IGE PON**
made from tallow...costing only **9½ cents per lb.**

IGE PON TE-42

AVAILABLE IN
BULK QUANTITIES

YOU CAN DO IT BETTER WITH AN IGE PON

ANTARA CHEMICALS

DIVISION OF
GENERAL DYESTUFF CORPORATION
435 HUDSON ST., NEW YORK 14, N.Y.

SALES OFFICES:
New York • Boston • Providence • Philadelphia • Charlotte, N. C.
Chattanooga, Tenn. • Chicago • Portland, Ore. • San Francisco
IN CANADA: Chemical Developments of Canada Limited, Montreal

ANTARA is now offering the first tallow-based synthetic detergent ever made for commercial use.

Because of its high performance at lowest possible cost, the new IGE PON TE-42 promises many new uses in broad fields of application.

If you use a detergent in your operations, we suggest you try the tallow-based IGE PON TE-42, a slurry form sold in bulk at 9½ cents per pound, f.o.b. shipping point.

Write today for technical data and a sample of IGE PON TE-42.

ANTARA CHEMICALS
435 HUDSON STREET, NEW YORK 14, N.Y.

Please send me technical data
and a sample of IGE PON TE-42

NAME _____
POSITION _____
COMPANY _____
ADDRESS _____
(Street) (City) (State)



MATERIALS

Blended emulsifiers well suited for pesticide formulations...

series applicable to most oil soluble toxicants
now being used

Uses: Developed especially for use in liquid insecticidal and herbicidal concentrates.

Features: Emulsifiers are reported to have outstanding resistance to hard water and produce immediate emulsions. Stability of most emulsions may be adjusted by varying amount of emulsifier.

Description: T-H emulsifiers, as series is known, are balanced blends of emulsifier components. All are dark amber liquids. Four blends are available for preparation of emulsion concentrates with most of the oil soluble insecticides and herbicide toxicants now employed. They are as follows:

T-H emulsifier C-I was primarily designed for use in emulsification of chloro IPC. Quantity required varies with stability of emulsion desired, ranging from 5 to 15%. This emulsifier is most water soluble in series.

T-H emulsifier D-I is reported to be especially suited for DDT and benzene hexachloride emulsion concentrates. It also has been used in making methoxychlor and rhothane emulsions. It is generally employed at level of 3 to 5%. Emulsifier is least water soluble and most oil soluble of series.

T-H emulsifier M-I will impart good emulsion characteristics to lindane, dieldrin, aldrin, heptachlor or similar toxicant concentrates. Requirements are from 2½ to 5%. Emulsifier is slightly less water soluble than C-I, but more water soluble than D-I.

T-H emulsifier W-I is recommended for emulsifying chlordane, toxaphene, parathion and esters of 2, 4-D and 2, 4, 5-T. Amount varies from 3 to 6% depending on concentrate being prepared. When used with esters emulsifier allows product to be diluted with oil and water. Emulsifier is intermediate in water solubility and slightly less oil soluble than D-I.

(Products of Thompson-Hayward Chemical Company, Dept CP, Kansas City 8, Missouri... or for more information check CP 5703, pages 2 and 3.)

Announce addition of 9 chemicals to line...

uses include pharmaceuticals, dye chemistry,
spectrographic research

Compounds, properties, and suggested uses are listed for nine chemicals added to maker's line.

Acenaphthene quinone has mw of 182.2, is crystalline (yellow needles), with mp 261.1°C. Useful in dye chemistry and as starting material in synthesis of various polynuclear hydrocarbons and their derivatives.

When inquiring check CP 5702 on handy form, pgs. 2-3



worth of
DOW CORNING

ANTIFOAM A

kills foam in:

- 300 lbs. of butadiene-styrene latex
- 1500 lbs. of maple-cane syrup
- 1000 lbs. of phenolic resins
- 400 lbs. of casein adhesive
- 500 lbs. of floor wax emulsion

and

- Saves space now wasted on foam in process equipment.
- Cuts processing time.
- Eliminates the waste and fire hazard of overflowing foam.
- Nontoxic and safe to use, Dow Corning Antifoam A is the most versatile and efficient defoamer on the market.

DOW CORNING ANTIFOAM AF EMULSION

This water dispersible emulsion of Antifoam A is equally versatile, equally effective in the industrial processing of aqueous foamers.

see for yourself!
mail coupon TODAY for
free sample

DOW CORNING SILICONES

Dow Corning Corporation
Midland, Michigan,
Dept. 88-13

Please send me data and a free sample of
☐ Dow Corning Antifoam A
or ☐ Dow Corning Antifoam AF Emulsion

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

When inquiring check CP 5704 on handy form, pages 2-3

MATERIALS

1, 2-Cyclohexane dione has mw 112.2, is crystalline with mp 38-40°C and bp 193-195°C. Useful in synthesis of analytical reagents and intermediates.

1, 2-Cyclohexane dione dioxime is crystalline with mp 189-190°C and mw 142.3. Reported useful for analytical determination of nickel because of ease with which it forms nickel salt.

Dihydroxytartaric acid has mw 182.1. Compound is white crystalline powder with mp 114-115°C. Its sodium salt is insoluble; thus the acid may be used as reagent for determination of sodium.

Dimethyl zinc is a liquid, unstable when exposed to air, but stable in sealed tube under carbon dioxide. Mw 95.45, mp about -40°C., bp 46°C. Useful in preparation of metallo-alkyl compounds.

Glyceryl trilaurate (trilaurin) has mw 639 and exists in three forms; stable form melts at 45-46°C while unstable forms melt at 36.4 and 18°C. Trilaurin occurs in many natural fats and is useful in cosmetic, pharmaceutical, and food industries.

Hydroxylamine nitrate (hydroxylammonium nitrate) is a white hygroscopic mass, mp 48°C, mw 96.1. Material decomposes at 100°C.

Methyl vinyl sulfide has mw 74.2, is liquid with bp 66.4-66.8°C. Compound is useful in preparation of elastomers and in high polymer research.

Tetracene (naphthacene) has mp 341°C and mw 228.3. Material occurs in coal tar, causing yellow tint of commercial anthracene. Useful in dye chemistry, in synthesis of polynuclear hydrocarbons, and in spectrographic research.

(Products of Bios Laboratories Inc., Dept. CP, 17 West 60th Street, New York 23, N. Y. . . or for more information check CP 5705, pages 2 & 3.)

**No more upsets in routines
because of paint odors . . .**

metal concentration and drying power doesn't suffer in odorless driers

Uses: In paint formulations.

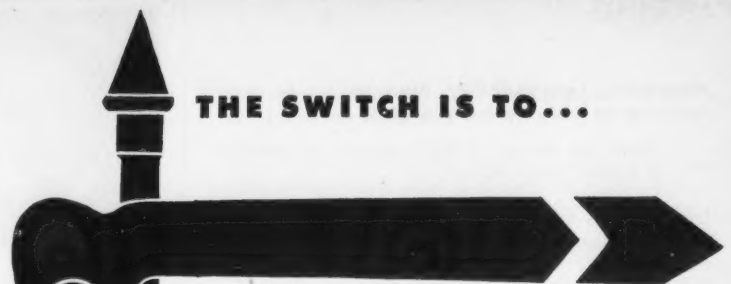
Features: Driers reported to be virtually odorless. Metal concentrations and drying power said to be comparable to driers having an odor.

Description: Maker offers cobalt and lead base driers. Both are naphthenate types and are miscible in Stoddard Solvent when in 1:10 wt ratio. Other properties are listed below.

	Cobalt Drier	Lead Drier
Metal, %	6.0	24.0
Viscosity, Gardner	B	D
Color	Clear purple	10 (Gardner)
Nonvolatile, %	63	64
Specific gravity, 25°C	0.900	1.135
Density, lb/gal, 25°C	7.50	9.45
Solubility, raw linseed oil (1:19 by vol)	24 hr clear	4 hr clear
Flash point (TCC), °F	110	110

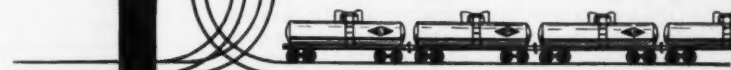
(Products of Witco Chemical Co., Dept. CP, 260 Madison Ave., New York 16, N. Y. . . check CP 5706 on handy form, pages 2 and 3.)

THE SWITCH IS TO...



FATTY ALCOHOLS

Quite possibly one or more of the many excellent qualities of the new Stepan higher fatty alcohols and fatty alcohol sulfates could be of benefit to you. Among these qualities are superior detergency, stability, emolliency, and emulsification. They are also ideal for use as adherents, penetrants, plasticizers, etc. The cost, too, may well be below what you are now paying for fewer advantages. Why not investigate?



STEPAN HIGHER FATTY ALCOHOLS

	12-Hydroxystearic Acid	14-Hydroxystearic Acid	16-Hydroxystearic Acid	18-Hydroxystearic Acid	20-Hydroxystearic Acid	22-Hydroxystearic Acid	24-Hydroxystearic Acid	26-Hydroxystearic Acid
MAKANOL I	8	27	15	30	2	55	3	42
MAKANOL II	8	27	17			4	2	52



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When inquiring check CP 5707 on handy form, pgs. 2-3

MATERIALS

Miscibility, compatibility, high bp, features of polymethoxy acetals . . .

report no change in their physical properties at high temperatures

Uses: As plasticizers, softeners, high boiling solvents, resin modifiers, shell-molding lubricants, core binders, demulsifying agents, and masked aldehydes.

Features: Compounds are miscible with a large variety of organic liquids and exhibit excellent compatibility with water-insoluble plasticizers and certain resins. Viscosities vary.

Description: Pmacs are mixed methoxy acetals produced from methanol and methyl vinyl ether. They are high boiling liquids, yellow in color, with an ethereal odor. Products are reported to be only slightly hygroscopic.

Pmacs are said to be thermally stable and do not contain heat stabilizers. Physical properties undergo no marked changes after heating for one week at 150°C.

Products are available in semi-commercial quantities with three grades being offered: Pmac-5, Pmac-10, Pmac-15. Typical physical properties are listed in table below.

	Pmac-5	Pmac-10	Pmac-15
Sp gr, 25/4°C	0.978	1.015	1.021
Lb/gal @ 68°F	8.19	8.50	8.54
Pour point, °F	-55	5	15
Flash point, °F	255	290	310
Bp, °C	140	220	230
Viscosity, 100°F centistokes	8.0	120	175

(Products of Commercial Development Department, General Aniline and Film Corporation, Dept. CP, 435 Hudson Street, New York 14, N. Y. . . . or for more information check CP-5708 on handy form, pages 2 and 3.)

Polyurethanes as adhesives for bonding rigid materials

Technical booklet of 15 pages gives latest information on polyurethanes as adhesives for bonding rigid materials, such as metal-to-metal or glass-to-glass. Polyurethanes are products prepared from a polyfunctional hydroxyl compound with an excess of diisocyanates.

Various raw materials and chemical reactions involved in this adhesive system are listed together with principles to be followed in preparation, curing, and use of isocyanate-based adhesives. In addition to adhesive information, other applications such as surface coatings and dielectrics are covered.

Bul P-151 is issued by Phosphate Division, Monsanto Chemical Co., Dept. CP, 1700 S. Second St., St. Louis 4, Mo. When inquiring specify CP 5708A on handy Reader Service slip located between pages 2 and 3.



ARMOWAX® OFFERS NEW BENEFITS TO INDUSTRY—HIGH-MELTING WAXES AND EMULSIONS

By Dr. M. R. McCorkle, Technical Director,
Armour Chemical Division

Armowax, Armour's high-melting methylene bis-stearamide wax, demonstrates interesting compatibility characteristics when mixed with natural and synthetic waxes. For example, 10% of Armowax mixed with paraffin wax gives internal crystallization, but 50% of Armowax produces a perfectly amorphous compound. This gives rise to new applications where Armowax, which is insoluble at room temperature, can be dissolved into hard wax blends at elevated temperatures.

In the electrical industry, Armowax is particularly effective when added to the protective wax coatings of condensers and capacitors. The high melting point, relative insolubility, and color and heat-color stability of Armowax produce a hard wax blend which will stand up under increased operating heat.

Powdered Armowax has also proved profitable in powder metallurgy operations. It will not melt under 132°C. heat of friction when the metal is compressed. And because of its inherent lubricating qualities, Armowax gives a good release from dies and molds. Powdered Armowax remains stable in storage, burns off with a minimum ash.

SPECIFICATIONS

Free fatty acids	5.0%
Color (NPA) (MAX.)	6
Ash	0.03%
Specific heat	0.532 @ 60°C
Flash point	250°C
Fire point	258°C
Molecular weight	579
Form	Lump or powder
Solidification point	132°C. (ASTM D-87-42)

COMPATIBILITIES

	% Armowax @ 25°C.
Resin, oil, wax	10 50 90
Paraffin wax 51°C.	C... C... C
Carnauba wax	C... C... C
Castor oil	LC... C... C
Rosin W W	LC... LC... C
Stearic acid	C... LC... C

© ARMOUR AND COMPANY

Microcrystalline	C... C... C
Oleic acid	LC... LC... LC
Ceresin	C... C... C
Ozokerite	C... C... C
Ethyl cellulose	C... C... C
Spermace	LC... C... LC
Beeswax	C... C... C
Mineral oil	LC... C... C

ARMOWAX—PARAFFIN BLENDS

% Armowax	Solidification Point	Compatibility @ 25°C.
0	51	
2	108	C
5	113	C
10	121	C
25	123	C
50	126	C
75	130	C
90	131	C
100	134	

ARMOWAX NONIONIC EMULSION

	(% by weight)
Armowax	10%
Emulsifier (77% Ethomeen® T/25, and 23% Stearic Acid—Neo-Fat® 18)	.2%
Water	88%

Heat the Armowax and emulsifier together to approximately 140°C. Add in a thin stream to boiling water, using vigorous agitation. Continue agitation until smooth (approx. 1 hour), or put the crude emulsion through a colloid mill or the equivalent.

This emulsion is extremely stable, of fine particle size, and very easy to prepare. It can be diluted to any desired concentration, and where slightly increased viscosity is not important, emulsions up to 25% may be produced by reducing the amount of water used. It can be used in automobile polish and in coatings for paper.

Information on the incorporation of Armowax into various emulsion formulations is contained in our Technical Bulletin F-2. For more general information, send the coupon with your letterhead for a free booklet on the Armids.

NEW USE INDICATED FOR ARMID® O—RELEASE AGENT FOR POLYETHYLENE



After cooling, the polyethylene control on the left stuck to the cup. The polyethylene at right containing 1% Armid O released immediately.

Preliminary investigation by Armour chemists indicates that 1% and less of Armid O incorporated into polyethylene will act as a release agent and lubricant. Armid O, a new member of Armour's amides series, is a soft, wax-like material which becomes ductile and smooth when worked between the fingers.

Evaluation of Armid O as a modifier for Polyethylene and Paraffin

	A	B	C	D	E
Polyethylene (Bakelite)					
DYGT	95.0	90.0	—	10	99
Armid O	5.0	10.0	10	5	1
Paraffin (140° F. M. P.)	—	—	90	85	—

The ingredients were heated together until clear and fluid. The solutions were then poured into aluminum weighing cups and allowed to cool overnight. The cooled samples were then checked for release from the cup, appearance and color.

RESULTS

The samples containing varying amounts of Armid O—A, B, C, D, and E—were released quickly by merely turning over the cups. The paraffin and polyethylene controls were all removed with difficulty from the cups. This suggests that Armid O may prove useful as a release agent in the manufacture of polyethylene film or containers where release is important. The Armid O modified samples exhibited improved "slip" properties. Viscosity was unchanged when observed in liquid state.

Send the coupon for our "Armids" booklet and for free samples of Armid O.



ARMOUR CHEMICAL DIVISION

ARMOUR AND COMPANY • 1305 WEST 91ST STREET • CHICAGO 8, ILLINOIS

CHEMICAL PROCESSING

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A year ago oleic acids Test. Now, report that stood a year. They have still have value.

Ester-free new Armour temperature crystallizes a solvent raw material advantages pressed-low temper substantial content these acids. These ized by bl stability.

Armour's Red Oil, 8-L Low Titer All of the 55 gal. drum aluminum day for quotations.



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Complete te —a new gro this illustra have shown fields, such cides, and a coupon for

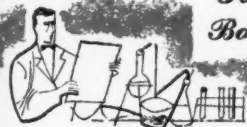
**ARMOUR OLEIC ACIDS
STILL STABLE—AFTER ONE
YEAR PACKAGE LIFE!**

A year ago, the high stability of Armour oleic acids was proved by the Mackey Test. Now, a year later, Armour chemists report that these superior oleics have withstood a year of package life with no change! They have resisted oxidation and rancidity; they still have excellent color; and they still have low unsaponifiable and high acid value.

Ester-free oleic acids are the result of a new Armour Chemical Division low temperature crystallization process which utilizes a solvent that does not react with the raw materials. This process assures you of advantages not found in ordinary distilled or pressed-type oleic acids. The extremely low temperatures employed guarantee a substantially lower saturated fatty acid content than conventional types of oleic acids. These new products are characterized by bland odor and excellent heat stability.

Armour's oleic acids include: Low Titer Red Oil, 8-11° Red Oil, Saponified Red Oil, Low Titer White Oleic, 8-11° White Oleic.

All of these products are available in 55 gal. drums and 4000 and 8000 gallon aluminum tank cars. Send the coupon today for specifications and current price quotations.

**For Your
Bookshelf****ETHO-CHEMICALS BOOKLET**

Armour's new Etho-Chemicals®, used as emulsifiers, detergents, wetting agents, and intermediates, are thoroughly discussed in this booklet. Emulsification and solubility charts, and new industrial applications are presented as an aid in selecting these profitable Etho-Chemicals.

DUOMEENS BOOKLET

Complete technical data on the Duomeens®—a new group of diamines—is offered in this illustrated booklet. These chemicals have shown properties valuable in many fields, such as asphalt additives, germicides, and anti-corrosion agents. Send the coupon for your free copy.

**McCOOK PLANT NOW PRODUCES
PUREST FRACTIONATED COCONUT OIL
FATTY ACIDS AVAILABLE!**

	Iodine		Acid Value		Ther. C.		Color, Lombard 5 1/4"	Caproic	Caprylic	Capric	Lauric	Myristic	Palmitic
	Min.	Max.	Min.	Max.	Min.	Max.							
Neo-Fat 8 (caprylic acid)	—	1.0	387	392	—	16°	2 R-20 Y	3	93	4			
Neo-Fat 10 (capric acid)	—	1.0	323	329	28°	33°	2 R-20 Y		3	92	5		
Neo-Fat 12 (lauric acid)	—	1.0	278	282	41°	44°	1.0 R-10 Y			1	95	4	
Neo-Fat 14 (myristic acid)	—	1.0	243	249	48°	52°	1.0 R-10 Y				3	94	3

A short while ago, the Armour Chemical Division announced that the purity standards have been raised on its line of fractionally distilled coconut oil fatty acids. Minimum concentration is now 92%! Because this is a degree of purity never before commercially available, these Neo-Fats have become more popular than ever.

The Armour-developed fractional distillation process makes available to you the specific fatty acid you require. Ordinary distilled coconut oil fatty acids are mixtures of up to nine different acids, in percentages varying from 0.5% to 48%. Each of these component acids has its own specific chemical and physical properties which make it valuable for some uses but unsatisfactory for others. When you buy from Armour, you get the specific acid you need, rather than a mixture of up to nine different ones.

The chart above gives the latest specifications for these Neo-Fats. At the same time that purity standards were raised, the iodine value of these acids has been lowered and the color lightened.

Send the coupon for a free copy of our new booklet, "Coconut Oil Fatty Acids" which includes pertinent information and suggested uses for each of these products. Makers of soaps, textiles, leather, pharmaceuticals, and many other products will find new profits in these new chemicals.



Aerial view of Armour's modern chemical plant at McCook, Ill., where new distillation processes produce fatty acids for industry.

**LOW COST NEO-FAT® 130 AVAILABLE
FOR ALKYD PRODUCERS**

Neo-Fat 130, Armour's regular grade fatty acid, is now available for alkyd producers who have requested a low cost product with a high iodine value, and excellent color. Neo-Fat 130 meets that demand. Specifications have been set as follows: Iodine Value.....125 Min. Acid Value.....195 Min. Titer.....28°C. Max. Color (Max.).....4 Gardner

MATERIALS**Durable yellow pigment developed
for exterior finishes**

Stable yellow pigment for outdoor coatings combines light fastness with alkali and heat resistance. It can be used in any type of finish where an extremely permanent yellow color is desired. Pigment is a calcined nickel titanium dioxide combining hiding power of titanium dioxide with the inertness of a calcined inorganic color. Single pigment in place of whites tinted with yellow toners eliminates possibility of pigment separation.

("Sun Yellow N" (formerly called Yellow BL-458) is a development of Harshaw Chemical Co., Dept. CP, 1945 E. 97th St., Cleveland 6, Ohio . . . or for more information check CP 5710 on handy form, pages 2 and 3.)

**Additives and pesticides
bills await action**

The Miller (R-Neb) bills, dealing with additives in foods, cosmetics and pesticides await action in the second session of the 83rd Congress. Only one bill, the pesticide bill (HR 4277) actually got a hearing before the House Interstate and Foreign Commerce Committee.

Although most branches of industry supported the bill it ran head on into opposition from government agencies. Objections were on technical grounds—making it almost certain that the bill will wear a new face when it comes from the Committee. The government agencies, however, expressed their support for the general objectives of the bill.

**Water-soluble cellulose derivative
offers variety of uses . . .**

in plastics, gelatin, paint, cosmetics, ink, and food products

Uses: As thickener and surface active agent in preparations containing mutual solvents where high degree of water and organic solubility are required. Reported suitable for water-soluble plastic fabrications.

Features: Material combines water-solubility with solubility in many hot and cold organic solvents. Possesses excellent stability to light, air-aging, alkalis, and weak acids. Toxicity reported low enough to permit use in cosmetics and food products.

Description: Methocel X-2602 is a water-soluble thermoplastic hydroxypropyl methyl cellulose ether. Fabrication techniques with which it may be used include extrusion, injection and compression molding, hot casting, and hot dipping. Fabricated objects are said to have excellent water solubility.

(Product of The Dow Chemical Company, Midland, Mich. . . . check 5711 on form, pages 2 and 3.)

When inquiring check CP 5709 on handy form, pgs. 2-3

Mail this coupon with your letterhead

Send literature: ☐ Etho-Chemicals Booklet ☐ Duomeen Booklet
☐ Oleic Acid specs. and prices ☐ Armid Booklet
☐ Tech. Bull. F-2 ☐ Coconut Oil Fatty Acids

Send samples: ☐ Armid O ☐ Armowax ☐ Neo-Fat 130

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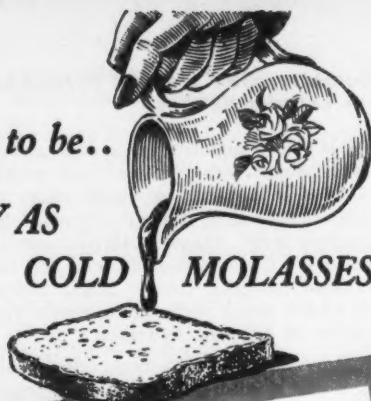
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SONNEBORN'S new ISO-PETRONATES are free flowing at room temperature. Now, for the first time, 62% concentrates can be used where steam is not available or where heating is difficult, assuring easier handling, suggesting new applications.

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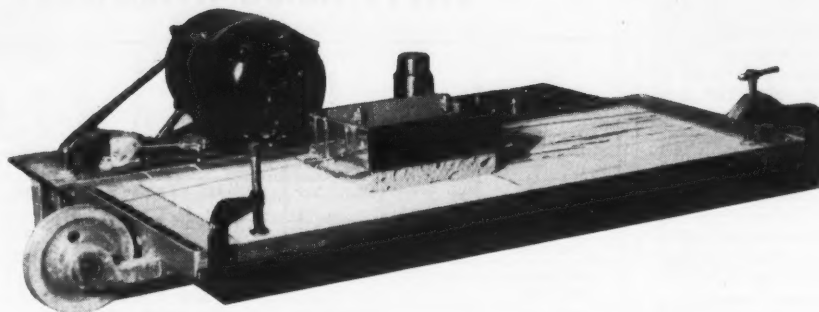
L. SONNEBORN SONS, INC., DEPT. CP-1
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- ☐ Please send me technical data on Sonneborn's new Petroleum Sulfonates.
☐ We need specific information. Please have your representative call.

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CITY _____ ZONE _____ STATE _____

When inquiring check CP 5712 on handy form, pgs. 2-3

materials



After several cycles with wet sponge washability test, paint (on left) made from styrene latices is still in excellent condition while the other latex coating (on right) has worn completely away in places

superior washability proved for paint prepared from styrene latices

Jones-Blair Paint Co. also finds that permanence and stability are among advantages achieved with use of polymers

Problem: Three years ago, the Jones-Blair Paint Co. of Dallas, Texas, recognizing the trend toward latex paints, engaged in a research study on these coatings preliminary to production in their own plant. Company tested all of the paints on the market at the time with the view of overcoming any deficiencies found through choice of ingredients and production methods.

Many of the paints tested were so water sensitive that the second coat caused lifting and blistering. By the same token, washability was poor for a long time. Along with this appeared sensitivity to freezing and thawing, which made ingredients come out of solution.

Another disadvantage found for some of the products was a lack of permanence in the film, which would not harden but would crack and peel. Also, it was discovered that the viscosity of some of the coatings became thick or thin on storage. In addition, some of the containers were corroding, with the bottom about to fall out in some cases. Some of the paints had a tendency to putrefy and develop a bad odor and gas in the can. In the

application of the second coat of some materials, a difference in sheen and color developed.

In their efforts to overcome the foregoing difficulties, Jones-Blair tried many different types of ingredients, many formulations, and varying methods of manufacture.

Solution: As a result of their research program, approximately two years ago the plant decided to produce a line of emulsion paints, known as Satin-X, using Lustrex Styrene Latices. These high molecular weight materials of high solids content result from the polymerization of styrene monomer in the presence of water. Photomicrograph illustrates the arrangement of polymer particles of styrene latex. Although a number of different types of these latices have been developed, usual formulation uses a combination of two to obtain the advantages of both.

Lustrex 601-40 used in these so called "rubber base" paints is an unplasticized type. According to manufacturer of latex, it is designed to be stable toward repeated cycles of freezing and thawing. It is capable of being post-plasticized and, in such a form, is an excellent vehicle for emulsion paints. Particles are sufficiently fine for good plasticization but not so fine as to permit ready agglomeration. Average particle size is 0.2 micron. Particles are negatively charged and pH range is 10.5 ± 0.2 .

Lustrex 820, also used in formula, is an alkali-soluble copolymer, supplied as a finely ground hard

resin. It reacts readily with ammonium or alkali metal hydroxides to form a water soluble salt useful as a protective colloid and emulsifier. As a 4 to 10% solution in water, it can be used to disperse pigments and to serve as a protective colloid by which freeze-thaw stability of an emulsion system may be improved. It also minimizes coagulation in emulsion systems on storage and emulsifies other film forming materials by cold mixing.

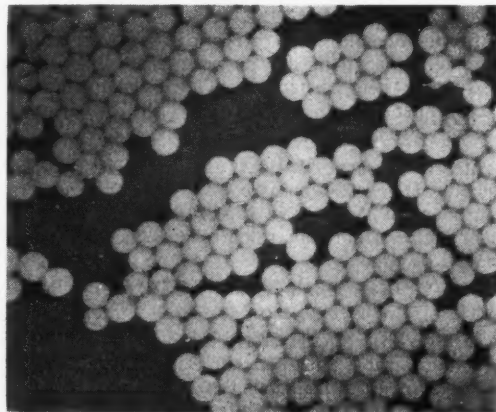
A typical formula of ingredients used at Jones-Blair in their development work on Satin-X follows. All of the water used in product is first processed through a mixed-bed deionizer.

WHITE SATIN FINISH

Materials	Weight in lb
PIGMENT	
Rutile TiO ₂	276
Waterground ² Mica 200/325	66
Water	287
PROTECTIVE COLLOID	
Lustrex 820	22
NH ₄ OH (28% NH ₃)	7.3
FOAM DEPRESSANT	
Glyceryl Monoricinoleate-S	11
PLASTICIZER	
Santicizer 160	83
Water	52
THICKENER	
Acrysol GS	22
LATEX	
Lustrex 601-40	275
Yield	100 gal
Pigment volume	29.5%
Vehicle solids	29%
Total Solids	52.5%

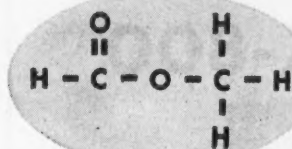
Pigments, Lustrex 820, and foam depressant are charged to a heavy duty paste mixer. After mixing, ammonia is added with further agitation, and then the plasticizer. After further mixing, the latex and thickener are added and mix agitated again. Mixture is then run through a J. M. Lehmann

(Continued on next page)



Polymer particles of styrene latex are shown in photomicrograph

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METHYL FORMATE

CHEMICAL PROPERTIES

READILY HYDROLYZED to methanol and formic acid by water containing traces of acids or bases.

REACTS WITH

- Ammonia to give formamide.
- Hydrogen in presence of catalysts to give methanol.
- Chlorine in the presence of light to form methyl chloroformate and chloromethyl formate . . . with an excess of chlorine to form trichloromethyl chloroformate.

SOLUBILITY DATA:

SOLUBLE IN WATER at 20°C. up to 30% by weight.

MISCIBLE with practically all organic solvents.

DISSOLVES cellulose esters and ethers, acrylic resins and polyvinyl acetate.

Here is a
versatile, low-boiling ester
you should investigate

Methyl formate is a low boiling (31.75°C.) solvent and chemical intermediate with a pleasant ester odor. Soluble in water up to 30% by weight, it is miscible with practically all organic solvents . . . is an economical and efficient solvent for cellulose ethers and esters, acrylic resins and polyvinyl acetate.

Chemically, methyl formate is readily hydrolyzed to methanol and formic acid . . . finds application in the manufacture of formates and other organic chemicals, including sulfa drugs. It is commonly used as an ingredient in fumigants because of its low boiling point.

Investigate the use of Du Pont methyl formate in your business. We'll be glad to send you more information on this versatile material—specifications, properties, suggested uses. Just send in the coupon below or write on your letterhead. E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Department, Wilmington 98, Delaware.

GRADE AND AVAILABILITY: Du Pont methyl formate is a water-white, mobile, volatile liquid with 97.0% minimum ester content as methyl formate. It is available in tank cars and 55-gallon non-returnable drums.

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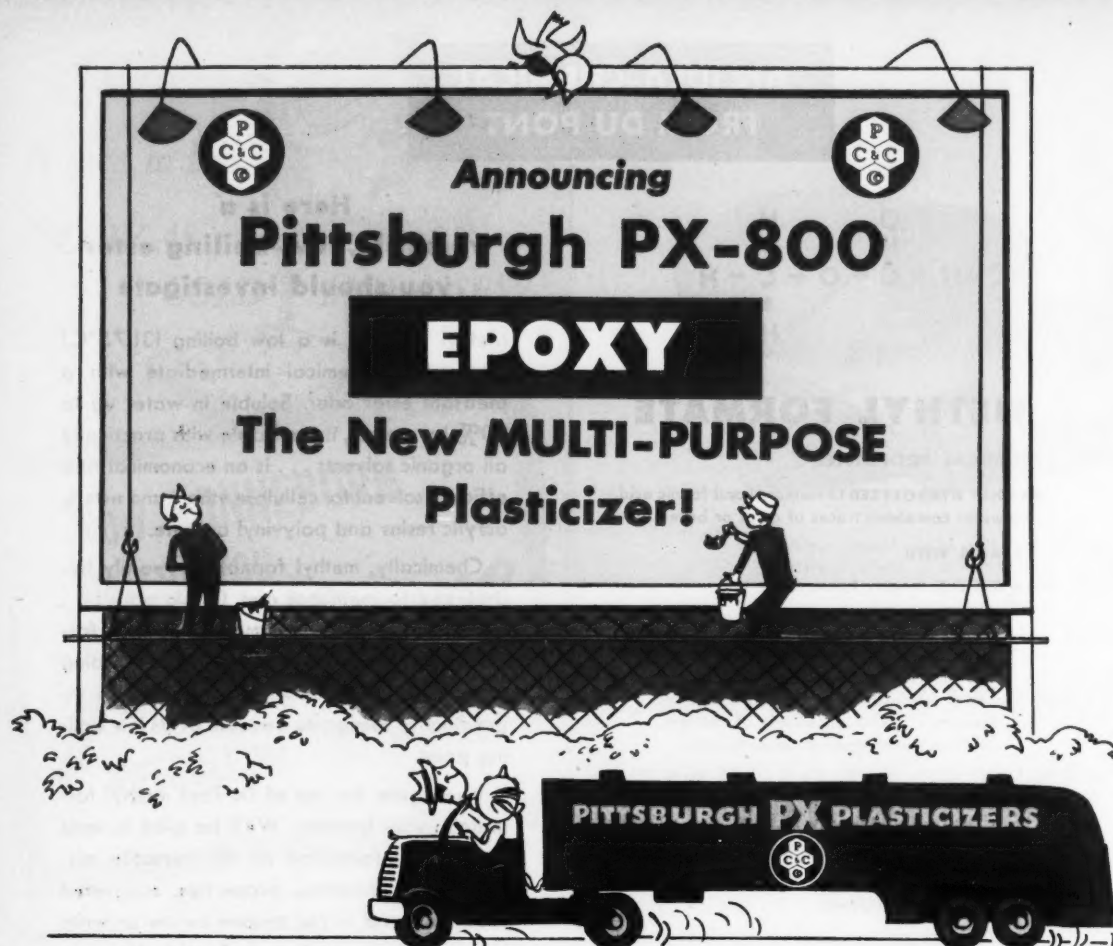
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Polychemicals Department 581, Wilmington 98, Del.

Please send me more information on Du Pont methyl formate—specifications, properties, suggested uses, bibliography, etc. I am interested in evaluating methyl formate for the following applications:

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When inquiring check CP 5713 on handy form, pgs. 2-3



WE ARE proud to announce an important new Pittsburgh PX Plasticizer which combines, in a single material, many important properties that can improve your vinyl formulations and frequently reduce your production costs.

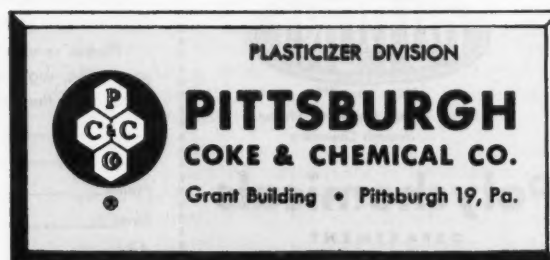
It is Pittsburgh PX-800 Epoxy, a new, high quality polymeric-type plasticizer of exceptionally high stability. This newest member of the broad and versatile family of Pittsburgh PX Plasticizers exhibits outstanding non-volatility characteristics . . . your best assurance of flexibility retention and resistance to cracking in vinyl products. Pittsburgh

PX-800 Epoxy combines unusual stability with low extractability, outstanding tensile strength and excellent heat resistance. And, from an economy standpoint, it is superior in many respects to plasticizers costing appreciably more.

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For additional information on new Pittsburgh PX-800 Epoxy Plasticizer, send today for Technical Bulletin No. 800.



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When inquiring check CP 5714 on handy form, pgs. 2-3

MATERIALS

(Continued from preceding page)

three-roll mill to yield desired rate combined with good dispersion. Basic stock white is aged a few days before tinting.

Two vital ingredients used in all of the paints are the latex emulsion and the stabilizer. Casein, soya protein, or starch could be used for the stabilizer but they are susceptible to putrefaction or viscosity change. Stabilizer used doesn't require cooking and does not have disadvantages of other materials.

Company also encountered a number of pigment problems in producing a variety of colors but these were overcome and Satin-X is made in 19 House & Garden colors.

Results: Superior washability is one of the outstanding advantages obtained for paint prepared from styrene latices. Washability is immediate and is better than other emulsion paints presently being marketed, according to manufacturer.

Illustrated is washability test in which a wet sponge has been rubbed over painted panel several hundred times. Jones-Blair Satin-X is still in excellent condition while other commercial latex paint on right has worn away in a number of places, revealing darker under-surface.

Paint has been found to have a high degree of permanence. It has unusually good retention of color and neither yellows nor changes tint on aging. Problem of spoilage in the can has been eliminated and the viscosity remains constant on storage. As far as the manufacturer of the paint is concerned, one advantage to him is the ease of manufacturing with the use of styrene latices. Product is easy to grind and paste that is formed can be readily worked, eliminating problem of uniform pigment dispersion.

As far as the user is concerned, the fact that the coating is odorless and the way it handles make an immediate favorable impression. Paint is easy to apply, not requiring brushing like conventional materials. In fact, an amateur can often apply it better than a professional. It doesn't sag or run. Also, after painting, the user can wash his hands under the faucet and clean paint brushes with water, which is much more convenient than using turpentine or other solvents.

Another advantage of coating is in repairing minor damage. Pencil marks can be washed off without the color being affected. Touching up can be accomplished without a change in the original color. Paint dries in 30 min to one hour.

(Lustrex Styrene Latices are manufactured by Plastics Division, Monsanto Chemical Company, Department CP, Springfield 2, Massachusetts . . . or for more information concerning manufacturer's product reader may simply check CP 5715A on the convenient Reader Service slip located between pages two and three.)

(Satin-X paint is manufactured by Jones-Blair Paint Company, Incorporated, Department CP, Post Office Box 7025, Dallas 9, Texas . . . or for more information concerning manufacturer's product reader may simply check CP 5715B on the convenient Reader Service slip located between pages two and three.)

Co-sulfonation of dodecylbenzene with fatty alcohols outlined

Co-sulfonation of dodecylbenzene with fatty alcohols can be accomplished as follows:

100 parts of dodecylbenzene are sulfonated with 133 parts of 20% oleum over period of 45 min at 75 to 80°F. 110 parts of Makanol 84 (fatty alcohol) at about 125°F are then added. Mixture is aged with agitation at 85 to 90°F for two hours. Total sulfonation mass is then neutralized by adding it slowly to a solution of 185 parts of 50% NaOH and 450 parts water. Temperature of neutralization is held below 120°F.

Resulting paste has following approximate composition:

Water	57%
Active	29%
Sodium sulfate	10%
Unsulfonated	4%
	100%

Active ingredient of this paste is composed of sulfonate and sulfate in the ratio of 50 parts sodium dodecylbenzene sulfonate, 33 parts sodium tallow alcohol sulfate, and 17 parts sodium lauryl sulfate. Unsulfonated content of slurry is essentially free fatty alcohol.

(Makanol 84 is produced by The Stepan Chemical Co., Dept. CP, 20 North Wacker Drive, Chicago 6, Ill. . . or for more information check CP 5716 on handy form, pages 2 and 3.)

Tougher shoe and carton cements produced with tackifiers . . .

emulsions also add tack to neoprene and latex

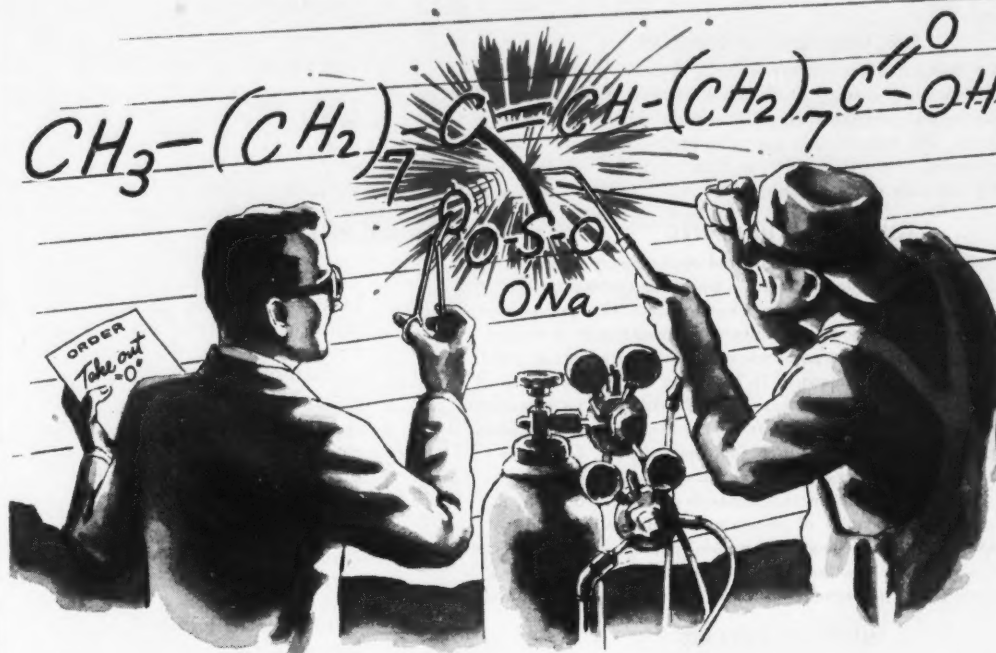
Uses: Formulated for use with natural, neoprene or GRS latices. Suggested applications are side lasting and sock lining cements in shoe industry, carton adhesives, and applications where instantaneous grab is required.

Features: High degree of emulsion stability obtained without sacrificing fast-breaking (fast-setting) properties.

Description: Arccos 25 and 26, as products are known, are resin emulsion tackifiers. Arcco 25 produces low viscosity, high strength adhesive bonds. Arcco 26 produces low viscosity, moderate strength bonds — but is said to develop greater tack in formulations. Both are colorless with pH of 10. Total solids are 42.5% and wt/gal is 8.5 lb.

When used with natural latex, maker recommends following proportions: tackifiers (wet), 60 parts; natural latex (wet), 40 parts. Higher or lower amounts may be used to modify tack and quick-setting properties.

(Product of American Resinous Chemicals Corp., Dept. CP, 103 Foster St., Peabody, Mass. . . or for more information check CP 5717 on handy form, pages 2 and 3.)



MADE TO ORDER

Acid Stability is obtained by eliminating the oxygen and establishing a carbon-sulfur bond.

This truly **sulfonated** oleic acid, unlike the common **sulfated** oleics, will not hydrolyze in acid solutions. Highly soluble, its effectiveness as a surface active agent improves in acid media.

SUGGESTED USES for **SUL-FON-ATE OA-5** include wetting, penetrating, and dispersing in nearly all acidic processing operations. These range alphabetically from A to W (Acid leaching— to Wool carbonization).

Pilot plant or semi-works quantities of this new **SUL-FON-ATE OA-5** are now available. It is produced as a 50% aqueous solution.



Literature and samples upon request.

ORGANIC CHEMICALS DIVISION

TENNESSEE **TC** CORPORATION

617-29 Grant Building, Atlanta, Georgia

When inquiring check CP 5718 on handy form, pgs. 2-3

This is our world

SPECIALISTS IN CHELATION

For more than a quarter-century we have devoted all of our time, talent and energies to the study of chelate chemistry. From this has resulted the origin, development and production of the Versene Chelating Agents. We manufacture no other products and have no other interests. Chelation and chelation alone is our business. It is the only world we know.

CHELATION UNLIMITED

Our specialization in this particular kind of chemistry now makes it possible for you to use chelation to solve problems created by the presence of metal ions in solution. Proof of its effectiveness may be found in all fields of science. In Agriculture, for instance, it cures iron chlorosis (deficiency) to the point where growth is stimulated, yield increased and maturation speeded. In Medicine, it stabilizes whole blood, decontaminates both internally and externally by removal of radioactive deposits, cures acute lead and other heavy metal poisoning, purifies and stabilizes drugs and pharmaceuticals, solubilizes "insolubles" in animal, human and mechanical circulatory systems.

In Industry, it separates rare metals, controls polymerization of cold rubber and plastics, prevents or removes metallic stains and contamination in processing of textiles, papers, dyestuffs, foods, beverages, etc., increases detergency of soaps and synthetics, softens water completely and permanently without formation of precipitates.

INVITE TO CHELATE

From these achievements you can see that the Versene Chelating Agents are powerful new "tools" for research and production. We invite you to use them to solve your own problem in chelation. We will gladly share our accumulated experience in this field. Send for samples and Technical Bulletin No. 2. Chemical Counsel on request.



"CHEMISTRY'S MOST PRECISE CHEMICALS"

BERSWORTH CHEMICAL CO., FRAMINGHAM, MASS.

CHAS. S. TANNER CO.
Liberty Life Bldg., Charlotte, N. C.

KRAFT CHEMICAL CO., INC.
917 West 18th St., Chicago 8, Ill.

BRAUN-KNECHT-HEIMANN CO.
San Francisco, California

WAREHOUSE STOCKS

SIEGEL CHEMICAL CO.
One Hanson Place, Brooklyn 17, N.Y.

GEORGE MANN & CO., INC.
251 Fox Point Blvd., Providence, R. I.

WEST COAST AGENTS

VAN WATERS & ROGERS, INC.
Seattle, Wash. & Portland, Ore.

WASATCH CHEMICAL CO.
2225 S. Fifth E., Salt Lake City, Utah

BARADA & PAGE, INC.
Houston, Dallas, Corpus Christi,
New Orleans, St. Louis, Wichita,
Oklahoma City, Tulsa, Kansas City, Mo.
BRAUN CORPORATION
Los Angeles, California

When inquiring check CP 5719 on handy form, pgs. 2-3

MATERIALS

Brighter color with non-leaving paste . . .

aluminum pigments also improve finish durability

Uses: Pigments have been developed for use in protective and decorative coatings.

Features: Pigments are non-leaving. Although they carry a grease film, it is of such a nature that flake will not leaf or flow when formulated in paint or other finish. This makes possible uniform dispersion of pigment throughout paint film and yields characteristic metallescent effect.

Increased film durability is also reported due to presence of metal particles in film, which reflect deteriorating light rays.

Description: Two types of non-leaving aluminum pastes are available. MD 584, standard lining grade, is recommended for improved appearance and workability in metallescent finishes for automotive or industrial use. MD 784, fine lining grade, is reported to have been developed specifically for hammer finishes and metallic enamels. Both types disperse easily and quickly when placed in paint or finish formulation, due to non-leaving characteristic and uniform particle size distribution.

(Products of Metals Disintegrating Co., Inc., Dept. CP, 1170 Arthur Blvd., Elizabeth B, N. J. . . . or for more information check CP 5720 on handy form, pages 2 and 3.)

Shows results of tests on bactericides

Technical and formulation information on manufacturer's brand of bithionol, an improved bacteriostat for soaps and skin preparations, is presented in 19-page bulletin. It presents data on what it says is one of the most exhaustive test programs ever conducted on a skin application product.

Included are detailed results of handwashing tests comparing antiseptic activities of Actamer and hexachlorophene as well as toxicological and dermatological data. In addition to stability and solubility data, bulletin gives

New Vehicle

Turns Liquid Chemicals Into Free-Flowing Solids!

TERRIA-LITE® VERMICULITE

— a lightweight, highly absorbent, mineral that makes it the ideal carrier for chemicals.

- ★ Free-flowing even when mixed with high percentage of chemicals.
- ★ Over 27,000,000 particles per lb. (28/65 mesh.)
- ★ Quick service from 39 plants.
- ★ Dust free.

Write For descriptive booklet and working samples.

ZONOLITE COMPANY

Dept. CP-14

135 S. LaSalle St.,

Chicago 3, Ill.

When inquiring check CP 5721 on handy form, pgs. 2-3

Subsidiary of ARAPAHOE CHEMICALS, INC.

GRIGNARD Reagent (RMgX) and the GRIGNARD Reaction

From stock or to order from this wholly-owned subsidiary of well-known

ARAPAHOE CHEMICALS, INC.

Production in our new and larger plant makes possible even better service and lower prices than formerly—same now as low as 60¢ per lb. delivered!

Custom orders for intermediates or finished products made via this useful, hazardous, anhydrous reaction are regularly produced on pilot and commercial scale; confidentially and/or exclusively yours, if desired. Our very location promotes maintenance of complete security!

Ask those who have used these Arapahoe products or services, or ask our nearest Agent—

MILLMASTER CHEMICAL CORP.—N. Y. C.

WM. E. PHILLIPS, INC.—Chicago

S. L. ABBOT CO.—Los Angeles and San Francisco

ARAPAHOE SPECIAL PRODUCTS, INC.

1970 — 28th Street • BOULDER, COLORADO

Producers of Special Organic Compounds

When inquiring check CP 5722 on handy form, pgs. 2-3

CHEMICAL PROCESSING

MATERIALS

suggestions for incorporating Actamer in soaps, shampoos, cosmetics, lotions, and includes a summary of federal regulations pertaining to products containing it.

Bul ODB-53-12 is available from Monsanto Chemical Co., Dept. CP, 1700 S. Second St., St. Louis 4, Mo. When inquiring specify CP 5723 on handy form, pages 2 and 3.

Add four products to line of beryllium alloys

Additions to manufacturer's line of beryllium alloys include: Beryldur, a copper base material combining properties of the high strength and low conductivity groups; a flake form of metallic beryllium of 99.5% minimum purity, suited to fabricating operations such as hot pressing; a high purity beryllium oxide, suitable for refractory shapes and ceramic bodies and for use as a catalytic agent; and a ferro-beryllium master alloy, which contributes to the hardenability of stainless steel.

(Products of the Beryllium Corp., Dept. CP, Reading, Pa. . . . or for more information check CP 5724 on handy form, pages 2 and 3.)

Shows role of chemicals in papermaking

Properties of paper-chemical products and their uses in papermaking are outlined in 24-page booklet. Sizing agents, resins, softeners, rewetting agents and alum and sodium phosphate aluminate are discussed.

"Your Partner in Papermaking" is issued by Paper Chemicals Dept., Industrial Chemicals Div., American Cyanamid Co., Dept. CP, 30 Rockefeller Plaza, New York 20, N. Y. When inquiring specify CP 5725 on handy form, pages 2 and 3.

For more information on product at right, specify CP 5726 . . . see information request blank between pages 2-3.

For production on an even level

Uniform production depends largely upon uniform ingredients. The uniformity of Nialk chemicals is recognized throughout the chemical-using industries.

a typical example...

NIALK CARBONATE OF POTASH: Good production schedules are maintained in the pharmaceutical and vitamin fields only when the uniform purity of vital ingredients is assured. Many leading drug houses specify NIALK Carbonate of Potash, knowing that its uniform high quality contributes to smooth production.

This uniformity in all NIALK chemicals is an important factor in keeping production on an even level in many fields.

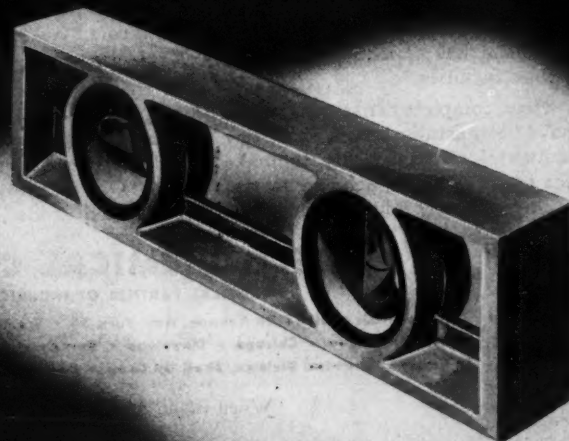
NIAGARA ALKALI COMPANY

60 East 42nd Street, New York 17, New York

Nialk[®]

LIQUID CHLORINE
CAUSTIC POTASH
CARBONATE OF POTASH
PARADICHLOROBENZENE
CAUSTIC SODA
TRICHLOROethylene

NIAGATHAL (TETRACHLORO PHTHALIC ANHYDRIDE)

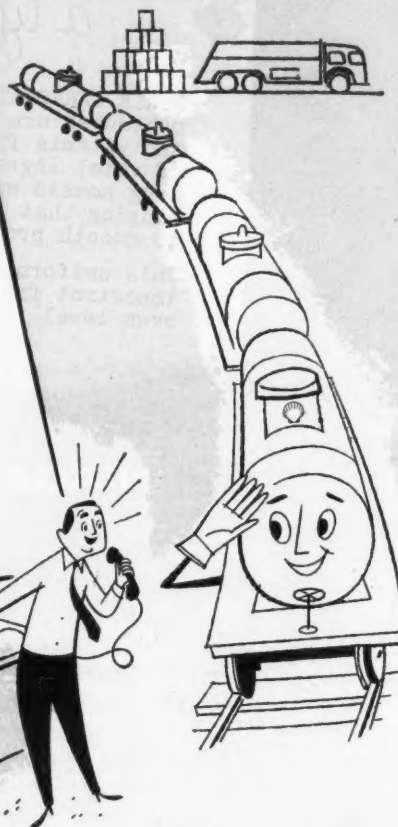


NOW!

SHELL CHEMICAL

ETHYL ALCOHOL

... from a drum
to a tank car
... in all major
formulations
... as close as
your telephone



As THE NEED for dependable petroleum-derived ethyl alcohol has become more and more urgent, Shell Chemical has expanded its distribution facilities.

Now, complete denaturing plants have been established in three key industrial centers, ready to make the fastest possible delivery to you in any quantity you may need . . .

in drums, tank trucks, compartment trucks, tank cars or compartment tank cars.*

Shell Chemical's ethyl alcohol is of the highest quality, meeting or surpassing all Federal and commercial specifications for purity. It is available as pure alcohol (190 proof), in specially and completely denatured grades, and as the two

proprietary solvents, Neosol® and Neosol A.

Your Shell Chemical representative will be glad to discuss your alcohol supply problem with you, at your convenience. You are invited to telephone or write.

*Tank truck and drum availability west of Rocky Mountains is limited.

SHELL CHEMICAL CORPORATION

CHEMICAL PARTNER OF INDUSTRY AND AGRICULTURE

Eastern Division: 500 Fifth Avenue, New York 36 • Western Division: 100 Bush Street, San Francisco 6
Atlanta • Boston • Chicago • Cleveland • Detroit • Houston • Los Angeles • Newark • St. Louis
In Canada: Chemical Division, Shell Oil Company of Canada, Limited • Toronto • Montreal • Vancouver



When inquiring check CP 5727 on handy form, pages 2-3

MATERIALS

Applications and properties of hexamethylenetetramine

Uses: Convenient source of water-free formaldehyde in manufacture of phenolic resins and as hardening and insolubilizing agent for proteins. Also used as stabilizer in plastics and as vulcanization accelerator in rubber.

Description: Hexamethylenetetramine, or hexamine, is a colorless crystalline solid made by reaction of paraformaldehyde and gaseous ammonia. It has applications in industry and medicine, and serves as starting point in manufacture of the powerful high explosive, cyclonite.

(Hexamine is being commercially produced by Mathieson Chemical Corp., Dept. CP, Morgantown, W. Va. . . . or for more information check CP 5728 on handy form, pages 2 and 3.)

Inhibitor allows metal packaging of quaternary ammonium compounds

Used in production of cationic disinfectants, quaternary ammonium compounds are said to be corrosive when packaged in metal containers. Inhibitor chemically composed of 2 hydroxypropylamine nitrite is now used to combat corrosive effects. It is soluble in water base materials, and is reported to be effective as an inhibitor in liquid soaps, phenolic and pine disinfectants, emulsion floor wax, and other water base compounds with a pH 8.0 or higher.

Manufacturer claims that .05% to 0.5% 2 hydroxypropylamine nitrite will inhibit corrosive properties of most products containing quaternary ammonium compound. Toxicity and germicidal properties of manufactured compounds are unaffected by addition of the inhibitor.

(Inhibitor is produced by R. M. Hollingshead Corp., Dept. CP, 844 Cooper St., Camden, N. J. . . . or for more information check CP 5729 on handy form, pages 2 and 3.)

Unpleasant odors of paints and varnishes reduced with masking agents

two products specially developed to combat volatile and residual odors

Uses: To mask unpleasant residual and volatile odors inherent in paint, plastics, and varnishes.

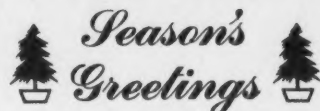
Features: Agents show remarkable resistance when exposed to high temperatures and/or chemically reactive materials.

Description: Two agents have been developed by manufacturer of industrial perfume specialties to help mask unpleasant odors in paints, varnishes and plastics. The first, a blend of aromatic chemicals is called Odormasque P and is capable of

U.S.I. CHEMICAL NEWS

★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★

NATIONAL PETRO-CHEMICALS \$45 MILLION PLANT OPENS



From
U.S.I. CHEMICAL NEWS
to its many readers,
contributors, and associates

Selector Takes Guesswork Out of Surfactant Choice

To take some of the laboratory trial-and-error out of building new emulsion formulas with surfactants, results of a manufacturer's experimentation are now available, condensed in the form of an automatic surfactant "selector". The instrument, a pocket-size twin dial arrangement, is said to offer emulsion formulators a precise surfactant recommendation for 96 different and specific formulation problems. Printed on durable card stock, the device measures 10½ by 6¼ inches and is accompanied by full directions. The formulas chosen for use on the dials are typical and basic. Therefore, the surfactant recommendations indicated may be used as a guide in solving numerous other problems, the manufacturer states.

Surfactant applications covered on the instrument include: 18 types of cosmetic products, 9 pharmaceuticals, 22 cleaning or detergent formulations, 18 agricultural chemicals, 10 textile chemicals, and 20 miscellaneous industrial formulations such as polishes, lubricants, and soldering fluxes.

New Carbon Black Reduces Glare on Concrete Roads

A new colloidal carbon black is expected to furnish the answer to road glare on many future concrete roads, according to a recent announcement. The obvious solution to road glare is to make the road dark in color. But in the case of concrete, carbon black (the most suitable pigment) neutralizes or counteracts the air-entrainment agents commonly used to make concrete more resistant to weathering. The new colloidal dispersion has been developed especially to overcome this difficulty, it is said. A six-page brochure is available describing the use of air-entrainment agents and carbon black, and shows the proportions needed to achieve various shades of color in roads, sidewalks, and floors.

Dedication Ceremonies Held November 11
For Giant Industrial Chemicals Project of
National Distillers and Panhandle Eastern

Chemical Safety Charts

Five new chemical safety charts, designed to give all the important information on handling, storing and shipping hazardous chemicals at a glance, are now available, it has been announced. A similar previous chart covered sulfuric acid. The present five deal with nitric acid, hydrochloric acid and hydrogen chloride, anhydrous and aqueous ammonia, carbon tetrachloride, and chromic acid and chromates.

Text on the charts is simple, concise and printed so as to be easily read. They are 2 by 2½ feet in size and are intended for posting in plants, warehouses, laboratories, and wherever else the chemicals are handled or stored.

U.S.I. Ammonia and Sulfuric Acid Plants Included in Project

November 11 marked the dedication of the new \$45 million National Petro-Chemicals Corp. plant at Tuscola, Illinois, where liquefied petroleum gases and industrial chemicals will be produced from natural gas. The giant plant is owned 60% by National Distillers Products Corp., which manages and operates it, and 40% by Panhandle Eastern Pipeline Co. It represents the greatest step so far taken by National Distillers in a long-range program to diversify its manufacturing operations.

Seven Major Producing Units

Located on a 500-acre site, the new plant consists of seven major producing units:

MORE



Part of the new skyline near Tuscola, Illinois, above what two years ago was prairie cornfield country. The gigantic new National Petro-Chemicals plant is owned jointly by National Distillers Products Corp. and Panhandle Eastern Pipeline Co., and will be operated by National.

U.S.I. CHEMICAL NEWS

CONTINUED Petro-Chemicals Operation

1. Hydrocarbon extraction and fractionation
2. Ethylene production
3. Ethyl alcohol production
4. Ethyl chloride production
5. Polyethylene production (under construction)
6. Sulfuric acid manufacture
7. Ammonia manufacture (under construction)

The hydrocarbon extraction and fractionation units are the largest in the world for the recovery of hydrocarbons from natural gas. When operating at full capacity, National Petro will process 400 million cubic feet per day of natural gas, which is pumped in from Panhandle Eastern's adjacent compressor station. It will have a daily output of approximately 500,000 gallons of natural gas liquids—propane, butane, isobutane, and natural gasoline. In addition, 10 million cubic feet per day of ethane will be recovered for conversion into ethylene.

Largest Ethylene Unit Ever Built

Petro's ethylene plant, the largest single unit of its kind ever built, can turn out 200 million pounds a year. The ethylene will be used initially for the production of 40 million gallons of synthetic ethyl alcohol and 50 million pounds of ethyl chloride per year. Alcohol production will total about 25% of the country's previous synthetic output. Production of polyethylene is scheduled for the second quarter of 1955. Initial output will be about 25 million pounds per year, with further expansion scheduled for the ensuing two or three years. A substantial portion of Petro's production of all products has been contracted for under long-term agreement.

The natural gas liquids will be distributed by Phillips Petroleum Co. The propane and butane will be sold largely as liquefied petroleum gas under the familiar name "Philgas", a Phillips trademark. The isobutane production will go mostly into manufacture of components of high octane aviation gasoline. The natural gasoline will be sold to

oil refiners for blending into motor fuel.

U.S.I. Plants Included in Project

Two new plants of National Distillers U.S.I. Chemicals Co. Division are also located on the Tuscola site and will be integral parts of the entire operation there. One plant is a \$2 million sulfuric acid plant which provides acid for the Petro alcohol manufacturing process. Sulfuric acid is also important to fertilizer manufacture. The other plant, still under construction, is a \$7 million unit to manufacture 50,000 tons of ammonia per year, some of which will be converted into nitrogen solutions widely used in fertilizer manufacture. Tuscola thus becomes one of the few places in the United States where both sulfuric acid and nitrogen solutions are produced.

Major Contractors Involved

Design of the plant required a year and the services of 400 engineers and draftsmen. More than 2,000 craftsmen were needed to turn the complex plans into reality.

J. F. Pritchard & Co., Kansas City, Mo. designed and built the hydrocarbon extraction and fractionation units, the LPG storage tanks, the power house, water treating and waste disposal units, and general services. An underground propane storage cavern was constructed by MacLean, Grove & Co., Inc., New York.

The Lummus Company, New York, designed and constructed the ethylene plant. The alcohol plant was designed by the Vulcan Copper & Supply Co., Cincinnati, and built by the J. F. Pritchard Co. The ethyl chloride plant was designed and built by the Foster Wheeler Corp., New York.

National Lead Company, New York, designed the acid recovery plant. Administration buildings were designed by Syl. G. Schmidt & Associates, St. Louis, and built by Felmley-Dickerson Company, Bloomington, Ill.

Design and construction of the polyethylene and ammonia plants are in the hands of M. W. Kellogg Company, New York. L'Air Liquide Society, Montreal, is designing the hydrogen and air purification plants. Leonard Construction Company, Chicago, designed and built the sulfuric acid plant; and The Chemical & Industrial Corporation, Cincinnati, is designing and building the nitric acid and nitrogen solution plants.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U. S. I.

Designed to prevent serious Christmas tree fires. A glass globe filled with colored extinguisher decorates the top of the tree, breaks automatically at 160° F. to flood and put out any flash fire as soon as it starts. (No. 990)

For stabilizing foods or synergizing food antioxidants. A new product called "H-124" shows promise. It acts as a very mild acid acceptor, has excellent ultraviolet absorption characteristics and remarkably low mammalian toxicity. Should be especially useful in extending shelf life of foods exposed to light and air. (No. 991)

For continuously measuring thickness variations down to 5 millionths of an inch on paper, plastic sheeting, metal foil, etc., a new device is said to operate on ordinary air under pressure. (No. 992)

A new home cleaner reportedly removes dirt, tar, rust and oil from all types of hard surfaces including metals, linoleum, tile, painted surfaces, furniture, plastics and automobiles. (No. 993)

Adjustable safety glasses, said to fit 90% of all faces, permit easy replacement of lenses and have a double bridge design claimed to more than double the frame strength. (No. 994)

An inorganic gelling and bodying agent for lubricating greases with potential uses in paints, adhesives, rubber, inks, waxes, resins and insecticides, is described as a colloidal form of the mineral attapulgite with a strong, needle-like particle structure. (No. 995)

To waterproof and revitalize shoes and other leather products, an aerosol chemical spray is being marketed which is claimed to protect individual cells in the leather rather than to be a plastic coating. One container treats 24 pairs of shoes, the maker states. (No. 996)

A new all-purpose electrical and metal degreaser is reported to be about 12 times less toxic than carbon tetrachloride, to dry faster, and to be useful on natural and synthetic fabrics as well as metals. (No. 997)

A new rubber film can be electronically sealed to itself, is said to permit assembly of vessels of any size with welded seams stronger than the material itself. (No. 998)

A new fast drying aluminum paint can withstand 1200° F. temperatures without discoloring or blistering, can be used for plating burners, stoves, hot pipes, ovens, radiators, etc., according to the manufacturer. (No. 999)

PRODUCTS OF U.S.I.

ALCOHOLS

Amyl Alcohol (Isocetyl Alcohol)
Butanol (Normal-Butyl Alcohol)
Fusel Oil—Refined
Propanol (Normal-Propyl Alcohol)

Ethanol (Ethyl Alcohol)

Specially Denatured—all regular and anhydrous formulas
Completely Denatured—all regular and anhydrous formulas
Pure—190 proof U.S.P.
Absolute—200 Proof
Solox—proprietary solvent—regular and anhydrous

ANTI-FREEZE

Super Pyro® Anti-Freeze
U.S.I. Permanent Anti-Freeze

ETHERS

Ethyl Ether, U.S.P.
Ethyl Ether, Absolute—A.C.S.

ACETONE—A.C.S.

ANSOLS

Ansol® M
Ansol® PR

ACETIC ESTERS

Amyl Acetate—Commercial and High Test
Butyl Acetate
Ethyl Acetate—all grades
Normal-Propyl Acetate

OXALIC ESTERS

Dibutyl Oxalate
Diethyl Oxalate

PHTHALIC ESTERS

Diamyl Phthalate
Dibutyl Phthalate
Diethyl Phthalate

OTHER ESTERS

Dialol®
Diethyl Carbonate
Ethyl Chloroformate

RESINS (Synthetic and Natural)

Arochem®—modified types
Arodure®—urea-formaldehyde resins
Aroflene®—pure phenolics
Aroflax®—for special flat finishes
Aroflint®—room temperature curing phenolic
Aroplaz®—alkyls and allied materials
Aroplol®—copolymer modified alkyls
Ester Gums—all types
Natural Resins—all standard grades

INSECTICIDE MATERIALS

Allerthrin
CPR Concentrates: Liquid & Dust
Piperonyl Butoxide
Piperonyl Cyclonene

Pyrene® Concentrates: Liquid & Dust
Pyrethrum Products: Liquid and Dust
Rotenone Products: Liquid and Dust

INSECTIFUGE MATERIALS

Isolone®
Triple-Mix Repellents

INTERMEDIATES

Acetoacetanilide
Acetoacet-ortho-chloroanilide
Acetoacet-ortho-toluidide
Acetoacet-para-chloroanilide
Ethyl Benzoylacetate
Ethyl Sodium Oxalacetate

FEED PRODUCTS

Calcium Pantothanate (Feed Grade)
Choline Chloride
Curbay B-G® 80
DL-Methionine (Feed Grade)
Niacin, U.S.P.
Riboflavin Concentrates
Special Liquid Curbay®
U.S.I. Vitamin B₁₂ and
Antibiotic Feed Supplements
Vacatone® 40

OTHER PRODUCTS

Acetaldehyde
Caustic Soda
Ethylene
IPC (Isopropyl-N-Phenyl Carbamate)
CIPC
Liquid Chlorine

Metallic Sodium
Methionine (Pharm.)
N-Acetyl DL-Methionine
Nitrocellulose Solns.
Propionaldehyde
Propionic Acid
Sulfuric Acid
Urethan, U.S.P.

*Reg. U.S. Pat. Off.

U.S.I. INDUSTRIAL CHEMICALS CO.

Division of National Distillers Products Corporation

120 BROADWAY, NEW YORK 5, N. Y.

BRANCHES IN ALL PRINCIPAL CITIES

producing an effective residual mask odor. Its main use is in the manufacture of the so-called odorless thinners.

The second product, Odormasque N, is more effective for use in industrial products requiring the masking of both volatile and residual odors. It is used mainly in manufacture of alkyd resins. Dosage ranges from 2 to 5 oz per 55 gal of material.

(Masking agents are development of Polak & Schwarz, Inc., Dept. CP, 667 Washington St., New York 14, N. Y. . . . or for more information check CP 5730 on handy form, pages 2 and 3.)

Pigment in paste form colors vinyl formulations . . .

assures maximum development of tinting strength

Uses: For paste-coloring vinyl formulations.

Features: Ultimate fineness of pigment particles is maintained, giving maximum development of tinting strength. Resistance to change caused by heat or light is good. Stock contamination problems are lessened as color dusting is not necessary. Dry or direct mill blending may be used.

Description: Stan-Tone Paste Colors are dispersions of organic pigments in dioctylphthalate plasticizer. Available in red, blue, and green, pigments are said not to bleed or migrate in product.

(Products of Harwick Standard Chemical Co., Dept. CP, 60 S. Seiberling St., Akron 5, Ohio . . . or check CP 5731, pages 2 and 3.)

Reports on easy-to-apply silicone-based resin

Properties and applications of silicone-based resin are described in 3-page bulletin. Coatings based on material may be air dried or baked. Manufacturer claims when air dried, coatings are superior in weather and sunlight resistance to any conventional organic finish; when baked the high order of heat resistance is displayed.

Resin can be pigmented in conventional manner or used in a clear varnish. Resin is easily blended with urea or melamine formaldehyde resins. Typical properties, suggested formulations, and compatibility data are included.

Bul 7-207 is issued by Dow Corning Corp., Dept. CP, Midland, Mich. When inquiring specify CP 5732 on handy form, pages 2 and 3.

For more information on product at left specify CP 5733 . . . see information request blank between pages 2 and 3.

since 1949 Glycerine is the Demulcent



Vicks Cough Syrup is a staple in medicine cabinets all over the world. Its popularity is due in part to the U.S.P. Glycerine contained in the basic formula. Besides making Vicks a more palatable liquid which can be tolerated by children of all ages, Glycerine provides the cough syrup with demulcent and expectorant qualities.

Glycerine is an ideal ingredient for many internal medicines. One important reason is the fact that U.S.P. Chemically Pure Glycerine is non-toxic. It is accepted by medical associations and government agencies as safe for human consumption.

Several other major properties of Glycerine are also important in such uses. In cough syrup for example, it acts as a demulcent, expectorant, dispersing or suspending agent, and sweetener, and adds body to the preparation.

Glycerine is also an important ingredient in many confections, flavoring agents, and other food products.

To get the complete story on why there's no single substitute that combines all of Glycerine's physical and chemical properties, write for your free copies of "Why Glycerine for Foods?" and "Why Glycerine for Drugs and Cosmetics?" Address Glycerine Producers' Association, 295 Madison Avenue, New York 17, New York.

Nothing takes the place of Glycerine

When inquiring check CP 5734 on handy form, pgs. 2-3

Fatty Nitrogen Compounds Aid Ore Flotation ☆☆☆☆ Polyamide Resins Are Color, Heat Stable ☆☆☆☆ Fatty Acids Improved

Ore Flotation using General Mills Alamines and Alamacs (fatty amines and amine acetates) has demonstrated its effectiveness and economy for processors of non-metallic ores.

Both Alamac 26-D and Alamac H-26-D do a fine job in potash flotation. Alamac 26 is preferred for feldspar. In phosphate ore flotation, operators say they're getting superior results with both Alamac 26 and Alamine 26.*

These General Mills fatty nitrogen compounds are made from selected tallow fatty acids, processed carefully to assure uniformity, high primary amine content, and ease of handling. Fatty amines and amine acetates are successful flotation agents because they frequently remove the minor constituents of an ore, rather than the major one.



Chemists Demonstrate Action of Fatty Amines on Crude Ore

Thus, less reagent is used per ton of ore and obvious economies result.

General Mills distilled primary amines are excellent raw materials for further processing because of their high purity and low secondary amine content. For example, they may be converted readily to a variety of quaternary ammonium compounds. These compounds are being used in steadily increasing quantities in the manufacture of bacteriostats, fungicides, textile finishes, and emulsifying agents. For additional information or samples of Alamines or Alamacs, please mail the coupon below.

☆☆☆☆

General Mills Polyamide Resins have been widely accepted in the coating, printing, laminating, labeling and adhesive fields. Continued development of these resins has resulted in even better heat and color stability at the present time.

These versatile, thermoplastic resins produce high gloss coating which has excellent resistance to water vapor transmission, grease and oils, abrasion, strong alkalis, mild acids, and hydrocarbon solvents. These resins are easily applied because they have a very sharp melting point (see viscosity curve). Naturally, they also set up quickly... without tackiness and blocking.

Polyamide Resin 93 is designed for solvent coatings. It has excellent heat-sealing and moisture-resistance properties. Resin 94 is frequently used for hot melt application where solvents are undesirable. It, too, is an excellent

*Recent reports indicate these fatty amines may also be useful in the beneficiation of taconite ores.

heat seal. Polyamide Resin 95 is a specially compounded product designed to give coating with superior anti-blocking properties and resistance to moisture vapor. For samples or technical data, mail the coupon below.

☆☆☆☆

Progress Thru Research is more than a phrase at General Mills. It's a way of doing business.

General Mills Aliphatic (fatty acid) 7, for example, is typical of the quality product that results from care in selecting materials and improving manufacturing processes. It contains a minimum of 90 per cent stearic acid. Its quality and uniformity are outstanding, and it has excellent color characteristics.

Aliphatic 7 is excellent for preparing aluminum, zinc and calcium stearates which are used as thickening, suspending, and flattening agents for paints and finishes. It's also a good raw material for esters.

Another fatty acid, Aliphatic 6-BW, fulfills requirements of the Toilet Goods Association specification 21. The stearic-palmitic ratio is closely controlled for composition and crystalline structure. Good color and odor stability make Aliphatic 6-BW attractive for cosmetics, candles, and textile specialties. For samples or information, please mail the coupon below.



Odor Evaluation of General Mills Chemical Products

General Mills

CHEMICAL DIVISION
KANKAKEE, ILLINOIS

Please send me samples and additional technical information for the products checked below.

- ☐ Alamines and Alamacs ☐ Fatty Acids
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progress thru research

When inquiring check CP 5735 on handy form, pgs. 2-3

MATERIALS

Coatings, inks will adhere better when hydrocarbon condensate is added...

improves adhesion of many resin polymers when used at 20-35% of resin solids

Uses: In coatings and adhesives; as an additive to improve adhesion of cellulose and vinyl finishes, gasoline resistant finishes, rotogravure and aniline printing inks, and rubber cement of Neoprene and nitrile rubber base.

Features: Has wide compatibility and offers good resistance to alkali, acid, and weather.

Description: Aromatic hydrocarbon condensate is 100% non-volatile, has brilliant, clear, transparent color, and has melting point of 85-90° C. It is soluble in alcohols, coal-tar solvents, esters and ketones; and insoluble in aliphatic hydrocarbons. Material is compatible with vinyl copolymers, vinyl chloride polymers, nitro and ethyl cellulose, aceto-butylate, cellulose acetate (limited), Saran, styrene, urea and melamines, as well as natural, synthetic, chlorinated and nitrile rubbers, phthalate plasticizers, shellac, and Neoprene.

(Advaresin CXF Special (formerly WH-1917) is a product of Advance Solvents & Chemical Corp., Dept. CP, 245 Fifth Ave., New York 16, N. Y. ... or for more information check CP 5736 on handy form, pages 2 and 3.)

Improves surface quality of rubber tile...

rubber molding resin makes hard, non-tacky product

Light amber, friable resin is odorless and non-toxic. It allows good mold-flow and fill-out without smearing of marbelizing. It gives hard, non-tacky surface in rubber tile flooring, even at elevated room temperatures.

Specific gravity of rubber molding resin is 1.04 and melting point 176°F. It is non-staining, highly resistant to discoloration by ultraviolet light, and soluble in all rubber solvents.

(MR-2088 resin is a product of Thermoid Chemical Co., Dept. CP, 400 Whitehead Rd., Trenton, N. J. ... check CP 5737 on handy form, pages 2 and 3.)

Concise information about ethyl acetate

Single sheet technical bulletin gives latest data on ethyl acetate. Uses, physical and chemical properties, and shipping and handling information are included.

Bul 20 is issued by Commercial Solvents Corp., Dept. CP, 260 Madison Ave., New York 16, N. Y. When inquiring specify CP 5738 on handy form, pages 2 and 3.

MATERIALS

Add aluminum octoate to product line

Manufacturer previously producing Napalm for government has added aluminum octoate to line of products. Current uses of this chemical are in the controlled bodying of pigment vehicle systems in paints and inks, and in paint and varnish removers.

(Nuogel AO is manufactured by Nuodex Products Co., Inc., Dept. CP, Elizabeth, N.J. . . . check CP 5739, pages 2 and 3.)

For pharmaceuticals—methyl isonicotinate

Pharmaceutical manufacturers who currently produce isonicotinic acid hydrazide can now reduce the hydrazide synthesis to a simple, 1-step process by using methyl isonicotinate, a new pyridine derivative. Product is being offered in pound and in drum lots.

(Reilly Tar & Chemical Corporation, Dept. CP, 1615 Merchants Bank Building, Indianapolis 4, Indiana . . . check CP 5740 on handy form, pages 2 and 3.)

Offer general information on phenolic plastics

Illustrated 20-page booklet gives properties, test values, molding techniques and applications of phenolic plastics. Property data table lists values of 5 types of phenolic when subjected to 24 mechanical, electrical and miscellaneous tests ranging from compression strength to water absorption. General steps in production of molded products are depicted along with 15 useful product design recommendations.

Booklet M-1 is issued by Bakelite Co., division of Union Carbide and Carbon Corp., Dept. CP, 300 Madison Ave., New York 17, N. Y. Specify CP 5741, pages 2 and 3.

For more information on product at right, specify CP 5742 . . . see information request blank between pages 2 - 3.



the solution to *your* problem may be a

WITCO

Water Dispersible Stearate

Since Witco first introduced water dispersible *Disperso Zinc Stearate*, inquiries have been made regarding other water dispersible metallic stearates. Accordingly, Witco *Disperso Aluminum* and *Calcium stearates* have been developed.

Witco Disperso Aluminum Stearate is readily dispersed in water. It is used in *rubber molding* operations, thereby providing excellent coverage and uniform film deposition on the most intricate shapes. Moreover, it provides an improved method for coating large surface areas, and may be substituted for *Disperso Zinc Stearate* where a lubricant of different melting point is required.

Witco Disperso Calcium Stearate imparts lubricity and light-proofness to *vinyl coatings* used over fibrous glass binder twine (where this type of twine replaces sisal baling twine).

Water-repellent properties for *paper and paper coatings* can be easily attained through the use of *Witco Disperso Calcium Stearate*.

Witco Disperso-type Stearates show promise for coating other pigments such as clays, aluminum powder, etc., from an aqueous medium.

Water dispersible stearates are another example of WITCO's continuing research in the development of new products . . . the improvement of existing ones.



Samples of WITCO Disperso Stearates are available for your own evaluation. Write today.

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PAPER

PIGMENT COATINGS

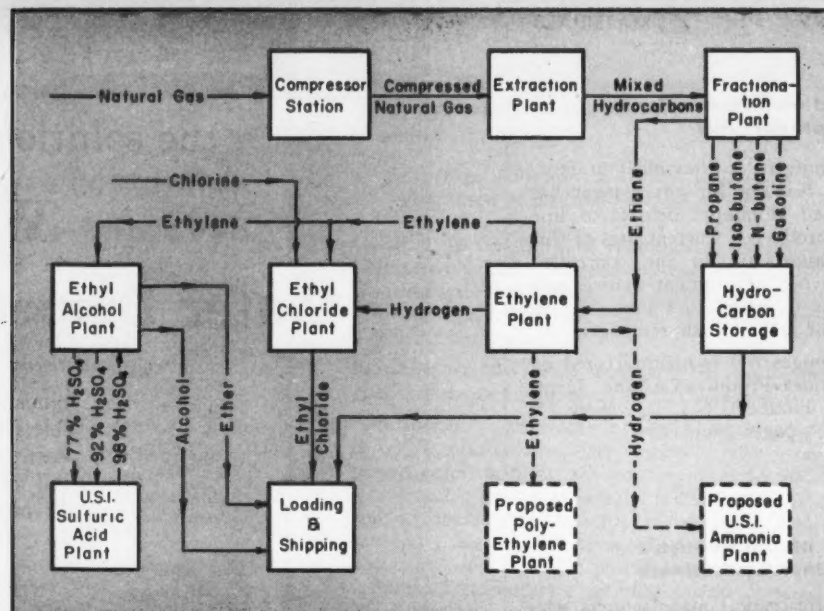


WITCO CHEMICAL COMPANY

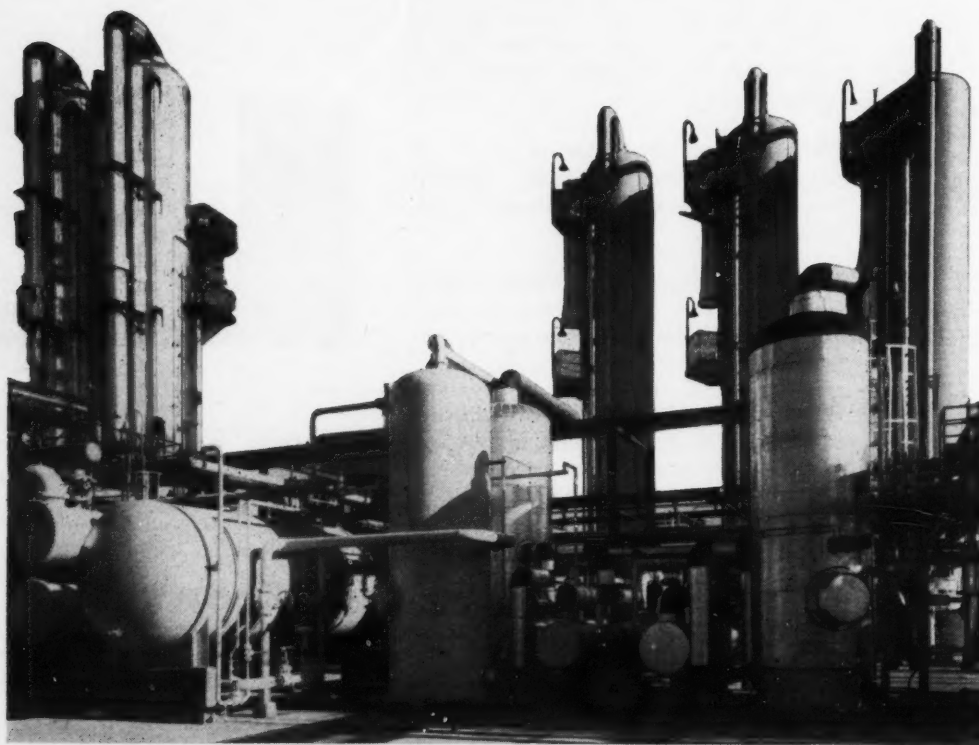
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CHEMICALS FROM NATURAL GAS



National Petro's \$50 million plant produces 125,000 gpd industrial alcohol, 50 million lb/yr ethyl chloride, plus propane, butanes, gasoline. Slated for future are 25 million lb/yr polyethylene and 50,000 tons/yr ammonia



Extraction plant where hydrocarbons are removed from natural gas

Tuscola, Ill. (pop. 3000), 28 miles south of Champaign and the University of Illinois, and in the heart of the state's great corn belt, officially became a "petrochemical landmark" this past Armistice Day. On that day, National Petro-Chemical Corporation dedicated its \$50 million plant for extracting hydrocarbons from natural gas and making products from them.

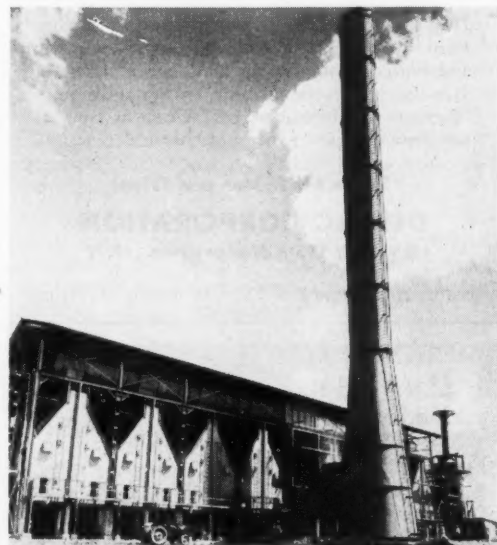
National Petro is owned 60% by National Distillers Products Corporation, which manages and operates it, and 40% by Panhandle Eastern Pipe Line Company, from whose adjacent compressor station the 400 million cu ft per day of gas for processing is drawn. About 40% of the ethane content and essentially all of the propane, isobutane, normal butane, and natural gasoline are extracted. What's left is returned to Panhandle's compressor station where it is blended with fresh gas to Btu content of 975 before being sent to consumers in Ohio and Michigan.

Propane (350,000 gpd), butanes (85,000 gpd), and gasoline (10,000 gpd) are recovered as salable products. The 10 million cfd of ethane recovered are cracked to ethylene which is currently sent to two units: 1) the alcohol plant for manufacture of 125,000 gpd of 190 proof ethyl alcohol and 9500 gpd of by-product ether, and 2) the ethyl chloride unit for production of about 50 million lb per yr of high-purity chloride.

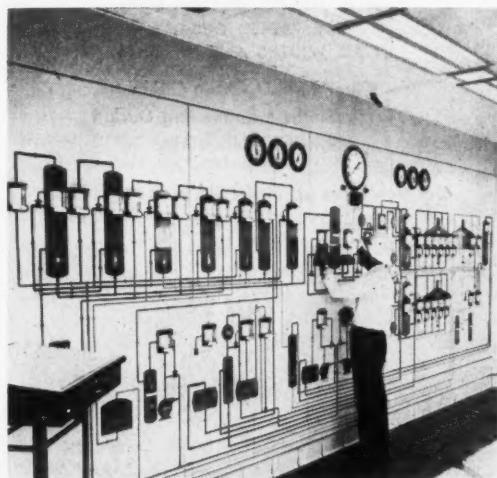
Later, much of the ethylene will be shunted to the polyethylene plant on the site, scheduled for operation by the second quarter of 1955. Initial production will be close to 25 million lb per yr, with further expansion scheduled for the two or three years following.

Concentrated sulfuric acid for the alcohol synthesis is supplied by adjacent National Distillers' U.S.I. Chemicals Division acid plant. Spent acid from the alcohol synthesis is concentrated to 92% in the alcohol plant's Simonson-Mantius vacuum units and then pumped to the U.S.I. plant for fortification to full strength, after which it is returned to the alcohol unit.

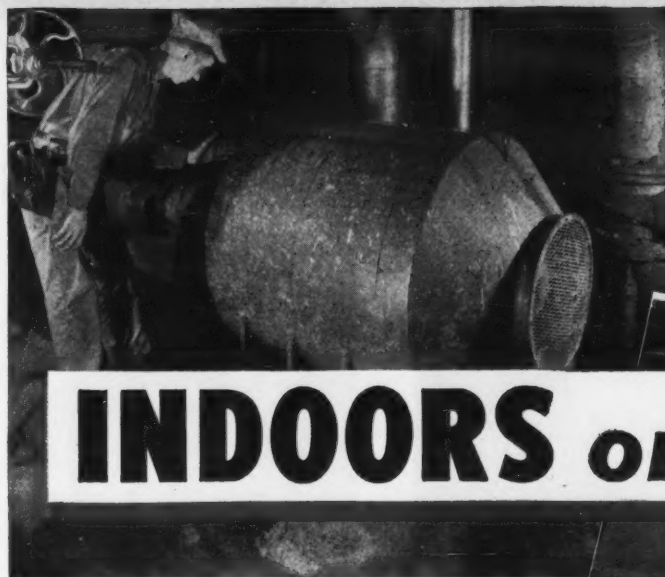
(Continued on page 45)



These furnaces, operating at temperatures exceeding 1400°F, crack ethane to ethylene



Graphic panel, similar to several others at Tuscola plant, monitors operation of extraction unit



INDOORS or OUT

**DIRT and
CORROSION**

Can't Hurt These Motors

Here is a totally-enclosed type of motor that will solve many of your dirt and corrosion problems. Install anywhere, indoors or out.

Cooling System is Self-cleaning

Cooling air is carried through the heat-exchanger tubes with sufficient velocity to expel practically any kind of dirt. If oily or sticky dirt should cling, tubes can be ramrodded clean in a few minutes because tubes are straight and tube ends are exposed.

Choice of Corrosion-resistant Materials

You can lick corrosion with this motor, too. Tubes are available in a variety of materials to meet practically any corrosive atmospheric condition. Allis-Chalmers tube-type motors have long and successful experience in such difficult applications as caustic plants, refineries and petrochemical plants, power plants with fly ash problems and many others.

Next time you need a motor for a dirty or corrosive location or for outdoor operation in all kinds of weather, call your Allis-Chalmers District Office. Get complete information on Allis-Chalmers tube-type totally-enclosed, fan-cooled and explosion-proof motors. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B7149. Available in ratings on frames larger than NEMA 505 up to 3000 hp.

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ALLIS-CHALMERS

When inquiring check CP 5743 on handy form, pgs. 2-3

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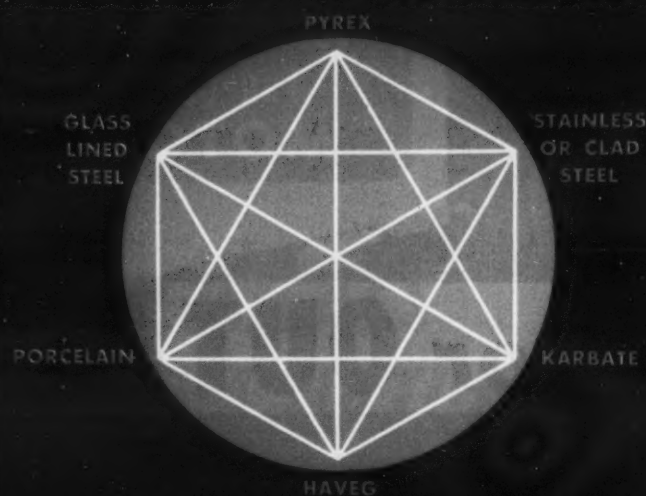
TEXROPE V-belts in all sizes and sections, standard and Vari-Pitch sheaves, speed changers.



PUMPS — Integral types from 3/4 in. to 72 in. discharge and up.



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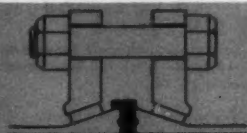
Join All Types of Chemical-Resistant Pipe and Equipment



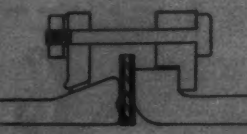
Chemiseal Teflon-Jacketed Gaskets, Types T6N or T6-300 are standard for Corning conical flanges, seal at unusually low bolt loads.



Chemiseal Flexible Couplings No. 202—(Teflon Bellows with two or three convolutions) and Chemiseal Expansion Joints No. 212—(several convolutions), for use in absorbing thermal or mechanical movement and vibration, protecting costly piping. Sizes 1 in. to 12 in. I.P.S. Require no gaskets or adaptors to join unlike piping ends and materials.



Chemiseal Snap-on Type 820 Gaskets. Teflon molded to match contour of conical-end glass pipe, assure perfect centering of joints—free flow of materials. For all standard pipe sizes, 1/4 in. to 6 in.



Chemiseal Teflon-Jacketed Adaptors No. 2-CRS, provide a tight, safe seal between unlike piping ends and nozzles. A steel bearing ring provides rigidity. Resilient core assures safe seal at low bolt loads. Teflon Jacket protects and contains easy-to-handle single unit.

UNITED STATES GASKET COMPANY

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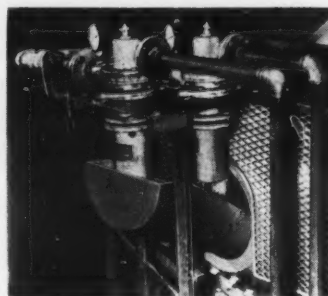
Representations in Principal Cities Throughout the World

When inquiring check CP 5744 on handy form, pgs. 2-3

IDEAS

Zinc reground circuit has wet cyclones

This photo shows two 3" diam wet cyclones (DorrClones) in the zinc reground circuit of a 1000 ton/day lead-zinc flotation mill which began operation in early 1953. An unusual feature in the



flowsheet of the mill (located in the Pacific Northwest) is a 90' diam thickener for tailing water recovery.

(Information courtesy of The Dorr Company, Dept. CP, Barry Place, Stamford, Conn.)

Bulletin shows versatility of metallizing material

Use of molybdenum for metallizing is described in 4-page illustrated bulletin. Application in forming dies, mandrels, and pulleys running under abrasive condition are shown plus uses for building up wearing surfaces.

Bul "Sprayed Molybdenum" is issued by Metallizing Engineering Co., Inc., Dept. CP, 38-14 30th St., Long Island City 1, N. Y. When inquiring specify CP 5745 on handy form, pages 2 and 3.

Soil phosphorous test takes one hour . . .

shows whether or not fertilizer will help

A fast, yet reliable, test for soil phosphorous has been developed by USDA and the Colorado Agricultural Experiment Station. Accuracy for new method is claimed to be greater than tests

(Continued on page 50)

DELTRAC Resiment

the Furane Resin Cement that

- RESISTS CORROSION - Acids, Alkalies, Solvents
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Highly efficient as a mortar for corrosion-resistant masonry, Resiment is low in porosity and high in compressive and tensile strength. It is supplied in the form of powder and liquid, in proper combinations, for mixing at time of use. Sets quickly by internal chemical reaction.

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When inquiring check CP 5746 on handy form, pgs. 2-3

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When inquiring check CP 5747 on handy form, pgs. 2-3

CHEMICAL PROCESSING

(Continued from page 43)

Some of the acid is removed from the alcohol plant's concentrator at 77%, and delivered to U.S.I. for external sale, mostly for production of superphosphate. An outside concern is planning to build a superphosphate plant on a tract of land adjoining Petro's 500 acres.

By October of 1954, there will be a 50,000 ton per yr ammonia plant running on Petro's grounds. Operated by the U.S.I. Division, the installation will make use of some of the hydrogen liberated in the ethane cracking process (the ethyl chloride process also requires hydrogen). Some of the ammonia will be converted into nitrogen solutions widely used in fertilizer manufacture. This will make Tuscola one of the few places in the United States where both sulfuric acid and nitrogen solutions — needed in fertilizers — are produced.

Processes used throughout are for the most part standard. Since the emphasis was placed on building a huge installation (for low investment and labor costs per unit of sales), Petro wisely preferred to stick with proven methods in their first venture of this kind. In spite of the capacity, nearly all products have already been sold under contract.

All tank car and truck loading positions are provided with odorizing equipment. Storage facilities are provided for 8,100,000 gal propane, 250,000 gal iso-butane, 500,000 gal normal butane, and 145,000 gal gasoline.

Water Needs High

Cooling tower capacity for the installation is 93,000 gpm, and about 2300 gpm are required for make-up. The nearby Kaskaskia River is the water source, but a 100 million gal reservoir has been built to provide surge and storage capacity.

Just to play it safe, two wells capable of supplying 7 million gal of water a day were drilled 24 miles upstream of the plant, where the water table was more favorable. When the river is low, the well water can be pumped into the channel to supply plant needs. Hence, the Kaskaskia is used as a natural aqueduct for the well water.

Phosphate operation to apply 6½ ton nozzle centrifuge

What is said to be the world's largest nozzle-type centrifuge (6½ tons) has been installed in the Bonnie Chemical Plant of International Minerals and Chemical Corporation, Bartow, Fla. It will supplement rotary drum filters, reducing fluorine content of the process stream by removing small solid particles of precipitated fluorides so that end products are purer.

The Bonnie plant processes phosphate ore for production of special grade fertilizer and high-quality poultry feed supplement. Uranium is also recovered as a vital by-product for the AEC.

(Model C-30, was supplied by Merco Centrifugal Co., Dept. CP, 150 Green St., San Francisco, Calif.)

**Tightest gate valve . . .
... you ever used!**

King-clip®

by **LUNKENHEIMER**

It closes tight . . . it stays tight . . . and here are four good reasons why:

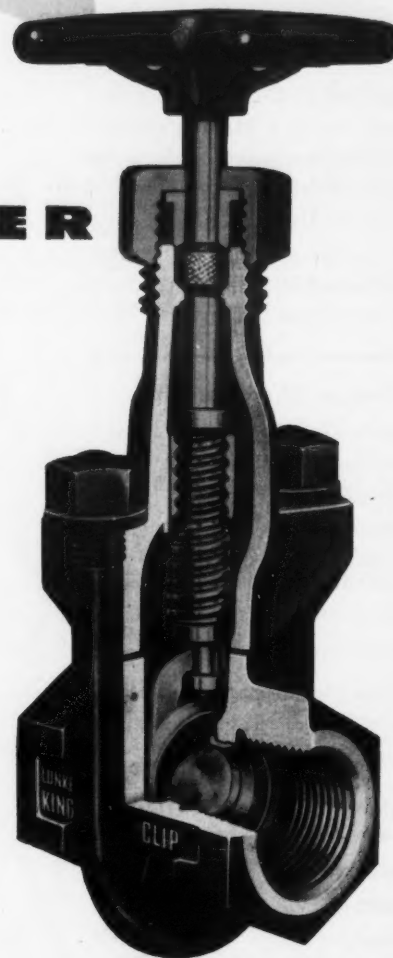
The new Non-Slip Handwheel provides a firmer, more comfortable grip for closing—even when the operator's hands are wet or greasy.

The body provides unusual ruggedness—protects the valve against distortion from wrenching or pipe stresses . . . and the steel clip permits quick disassembly and reassembly.

Extra thread length prevents pipe ends from jamming against diaphragm or seat rings to force them out of line. Threads accommodate both A. P. I. and standard threaded pipe.

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*the original clip
valve with the NEW
non-slip®
handwheel**



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BRONZE IRON STEEL

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When inquiring check CP 5749 on handy form, pgs. 2-3

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Designated as Empol 1022 Polymerized Fatty Acid, this unique C_{36} , unsaturated dibasic acid offers unlimited utility in many unusual applications. Check over these typical characteristics and see if Empol 1022 has a place in your development program.

Typical Characteristics

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Saponification Value.....	190
Neutralization Equiv.....	300
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Viscosity at 25°C (Gardner-Holdt).....	Z4
Flash Point, °F.....	530

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Cincinnati 2, Ohio

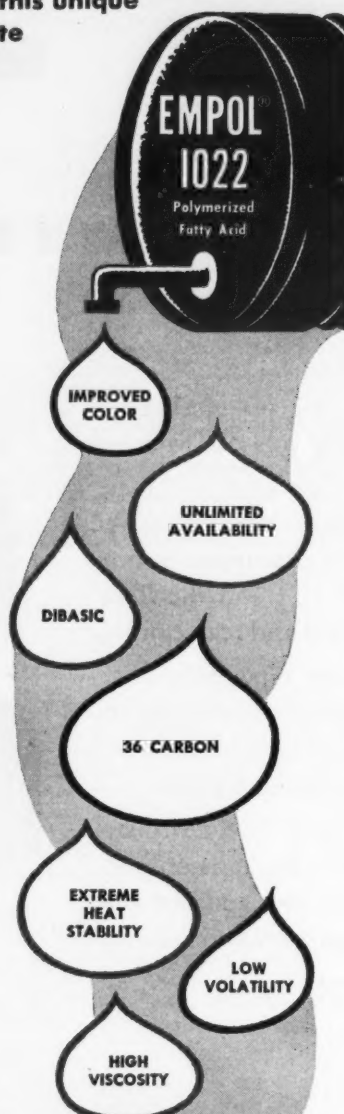
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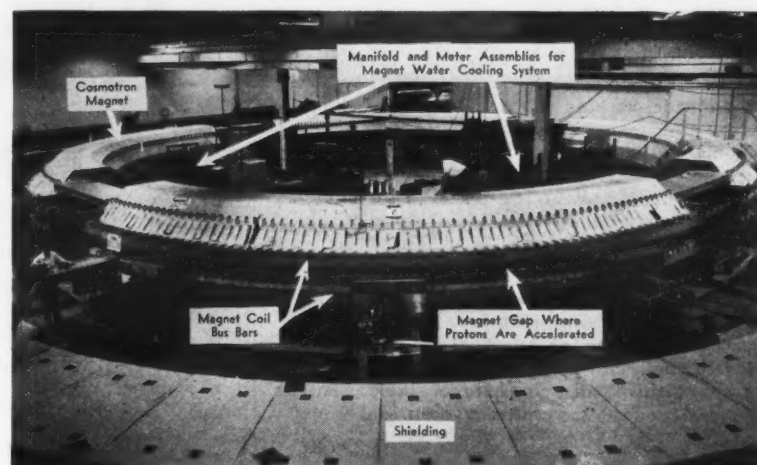
Company.....

Address.....

City.....State.....



ideas



Brookhaven National Laboratory's Cosmotron, pointing up salient features. Unit recently produced the first artificial V-particles

Demineralization of cooling water proper functioning of Brookhaven's

Raw well water with total hardness of 70 ppm would result in leakage currents between coil and grounded piping . . . demineralized water with dissolved electrolyte content of 5 ppm does job

The Cosmotron at Brookhaven National Laboratory, Upton, L. I., New York, is actually an atom-smasher which employs "bullets" consisting of protons (ionized hydrogen). Protons are accelerated to an energy of 3 billion electron volts and directed against a variety of targets in order to study the nuclear properties of the target material.

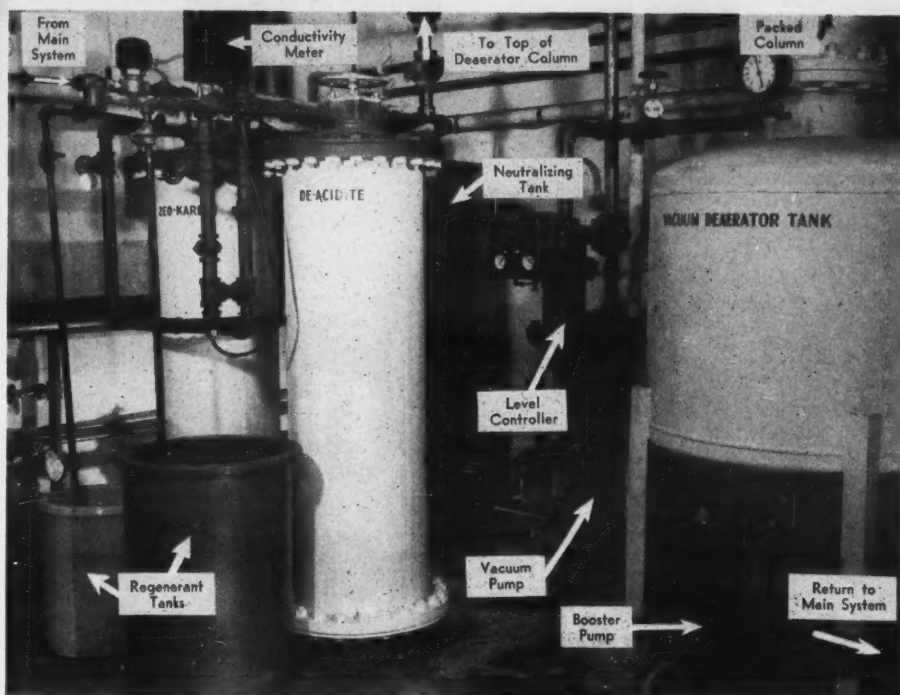
Distinguishing feature of the Cosmotron is a 1700 ton electro-magnet in the shape of a doughnut with a 30' radius. A C-shaped gap running around the outer periphery of the magnet serves as a racetrack in which the protons travel during their acceleration. Magnet coil consists of 384 copper bus bars,

connected in series. Each bus bar is approximately 50' long and $2\frac{3}{4} \times 3\frac{3}{4}$ " in cross section. An oval hole (0.11 sq in area) runs longitudinally through each bus bar. Cooling water is circulated through each bus bar. This provides a more compact design than would be afforded by air cooling.

Because the coil voltage is 3000 volts, it was necessary to use water of low electrical conductivity in order to minimize leakage currents between the coil and the grounded piping. Design called for water with total dissolved salts of 5 ppm as $CaCO_3$; however, the only cooling water available was well water with a total hardness of 70 ppm. Obviously, this would not be satisfactory.

A Permutit demineralizing system was selected to provide cooling water of required analysis—5 ppm total dissolved electrolytes (actually zero total hardness). The demineralizer unit consists of a cation exchanger, anion exchanger, and a deaerator. Cation exchanger contains 4 cu ft of Zeo-Karb "H" (sulfonated coal-type, acid-resistant resin), and the anion exchanger is actu-

When inquiring check CP 5750 on handy form, pgs. 2-3



Components of the Cosmotron cooling water demineralization system

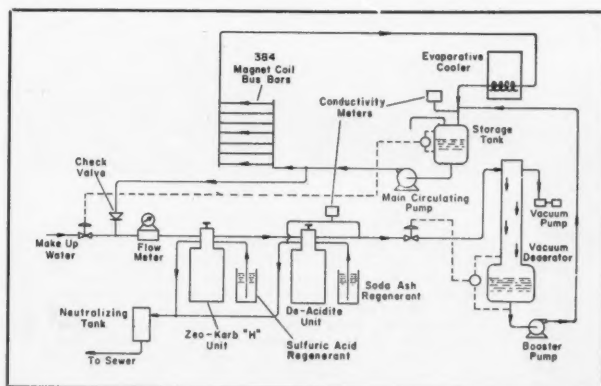
essential to Cosmotron

ally an acid absorber containing 4 cu ft of De-Acidite (polyamine resin). The deaerator consists of a 20' high Raschig-ring-packed tower above a sump tank, and is maintained under vacuum by a mechanical vacuum pump. An acid neutralizing tank treats regenerant solutions prior to discharge to sewer.

The magnet cooling system recirculates 500 gpm of demineralized water through the magnet coil and evaporative coolers. Evaporative coolers are employed to prevent loss or contamination of the demineralized water. Demineralizing unit is placed in parallel with the magnet coil and handles 9 gpm continuously. Makeup water to the system enters through the demineralizing system.

Some of the control features of the system include: 1) A totalizing flow meter for demineralized water. 2) Electrical conductivity meters—one is located in the effluent from the De-Acidite unit for checking conductivity during normal operation and during regeneration. Other is located in the

(Continued on next page)



Flow diagram of demineralization system for Cosmotron cooling water at Brookhaven National Laboratory

Have you tried "that new snap-on PIPE INSULATION?"

"That new snap-on pipe insulation" that's causing so much comment in industry is G-B ULTRAFINE PIPE INSULATION. It's the first and ONLY one-piece molded pipe insulation of fine glass fibers—ideal for hot or cold piping, for plant maintenance or new construction.

To the many advantages you see illustrated below, you can add ECONOMY. G-B ULTRAFINE PIPE INSULATION costs no more than other insulations, and users report APPLICATION SAVINGS UP TO 50%!



ONE MAN, ONE HAND—that's all it takes to handle new G-B ULTRAFINE PIPE INSULATION. (This 6-foot section weighs just a shade over 4 lbs.!) No harm done if the workman should drop it—for this insulation is flexible and resilient, won't break or crumble.



A "SNAP" TO APPLY—simply pull the single seam apart, and G-B ULTRAFINE PIPE INSULATION snaps itself around the pipe! No special tools or skills required. With any knife, you can readily cut this new insulation to go around obstructions.



EASY TO FINISH—simply close seam tightly with any standard type fastener—then paint... leave "as is"... or finish as desired. Thermal efficiency of the finished job is so superior that you get the same "heat saving" with less wall thickness!

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When inquiring check CP 5751 on handy form, pgs. 2-3

IDEAS

(Continued from preceding page)

main piping system for checking blended water conductivity and is wired directly to main control console of the Cosmotron. 3) A flow control valve in the demineralized water circuit maintains a constant level in the deaerator sump tank.

According to L. D. Stoughton, Mechanical Engineering Division at Brookhaven, the demineralizing system is completely effective in reducing well water to a total electrolyte content of 5 ppm, thus minimizing leakage currents between the coil and grounded piping.

It may be interesting to note that successful operation of the Cosmotron at Brookhaven was recently evidenced by the announcement that the first artificial V-particles had been produced with it, together with a 7' cloud chamber. Particles were detected with a mechanical scanning device and by photographic means. Research team at Brookhaven found that an average of merely one nuclear event involving a neutral V-particle is detected for every 2000 photographs of 2-bev neutrons passing through atoms of hydrogen in the cloud chamber. Team at Brookhaven reporting their findings consists of W. B. Fowler, R. P. Shutt, A. M. Thorndike, and W. L. Whittemore.

(The resins and equipment in the Brookhaven demineralizing system are products of The Permutit Company, Dept. CP, 330 West 42nd Street, New York, New York . . . or for more information check CP 5752 on handy form located between pages 2 and 3.)

Lab's testing facilities aid chemical users

Detailed information describing laboratory services offered to those using industrial chemicals, food-grade antioxidants, gasoline additives, and textile dyes is contained in 20-page brochure. Specific services available in the food, textile, protective coating, miscellaneous chemical, gasoline, physical testing and polymer laboratories are outlined.

Brochure "Eastman Service" is issued by Eastman Chemical Products, Inc., Div. of Eastman Kodak Co., Dept. CP, Kingsport, Tenn. When inquiring specify CP 5753 on handy form, pages 2 & 3.

Downington Iron Works, Inc.

These two exchangers, fabricated by Downington Iron Works, Inc., Downingtown, Pa., are used in condensing benzene. Ampco Metal Tube sheets are welded to a steel shell and the heads, also made from Ampco Metal, are welded to steel flanges. All welding is done with Ampco-Trode® electrodes. Shell diameter 14". Tube length 10 feet.

Heat Exchangers of

The Whitlock Manufacturing Co.

This 4-pass exchanger was fabricated by The Whitlock Manufacturing Co., Hartford, Connecticut. The service is product cooling, with river water as the cooling medium. Channel cover — steel, lined with Ampco Metal Grade 8. Channel, including flanges — Ampco Metal Grade 8. Tubes — 1323 sq. ft. — 3/4" OD x 16 BWG x 16'-0" Ampco Metal Grade 8. Physical construction — Whitlock Type 4-ST-4 straight tube floating head (split-ring assembly design). Shell diameter — 27 inches ID.

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faces — Sand-cast.

Valve bodies — Sand-cast.

AMPCO* METAL

resist corrosion and erosion

YOU can get better service from your heat exchangers, when you use Ampco Metal for those parts that are subjected to attack by corrosion or erosion.

But heat exchangers are not the only application for Ampco Metal. You find it used in many places in the process industries and in marine service as well . . . for tanks, pipe, separators, bubble caps, fractionating towers, stills, condenser water boxes, agitators, etc. — wherever you need high resistance to corrosion and erosion.

Ampco Metal Grade 8, one of the Ampco series of engineered aluminum bronze alloys, is Boiler Code approved for unfired pressure vessels. In addition, you get these unique properties: high resistance to corrosion . . . high tensile (75,000 psi) . . . high physicals at extreme temperatures . . . high strength to weight ratio . . . high impact and fatigue values (Charpy @-423° F., 93 ft. lbs.; @ 70° F., 75 ft. lbs.; fatigue limit 28,000 lbs. @ 100,000,000 cycles) . . . high resistance to wear from erosion, abrasion, cavitation pitting . . . high compressive strength (E. L. in Comp. 25,000 psi) . . . high modulus of elasticity (18,000,000).

Moreover, Ampco Metal Grade 8 is easy to fabricate with Ampco-Trode* welding wire, rods, or covered electrodes. And, Ampco Metal Grade 8 is available in a variety of forms — sheet, plate, extrusions, pipe, tubes, fasteners, etc. Since it is the answer to many problems, it may help you. Consult your nearest Ampco Field Engineer or write us for further information.

Mail this coupon today!

*Reg. U. S. Pat. Off. Ampco Metal, Inc., Milwaukee, Wisconsin

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AMPCO METAL, INC., Dept. CP-1, Milwaukee 46, Wisconsin

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Company.....

Company Address.....

City.....(.....) State.....

PR-9

IDEAS

New view of atomic nucleus — fuzzy

It now appears that the nucleus of an atom is dense at the center and becomes more diffuse toward the edges — which might be described as "fuzzy." This is the picture drawn by Prof. James Rainwater and graduate student Val Fitch, two Columbia University physicists.

Up to now scientists have been using a simpler mental picture of the atomic nucleus — more for convenience than because of any concrete knowledge. The conventional nucleus has been thought of as a plain sphere, somewhat like a marble. It has thus been assumed that the nucleus was of uniform density with sharply-defined edges.

The Rainwater-Fitch experiments measured nuclear density in a new way, using mu minus mesons produced by Columbia's 385,000,000 electron-volt synchro-cyclotron. Employing the conventional nucleus, the Columbia measurements indicated a nuclear radius 15% smaller than earlier experiments.

It is unlikely that either old or new measurements are inaccurate, however, all of them having been repeated frequently. Prof. Rainwater believes that the explanation for the 15% difference lies in the true structure of the nucleus, which he believes to be the fuzzy-edged one described. Earlier methods, he explains, measured nuclear density out near the edge, while his own sampled the nucleus much nearer the center.

Film tells industrial research story

Movie tells story of industrial research and its contribution to the ultimate consumer. How basic and applied industrial research is financed through corporate profits is also depicted. Running-time for the 16mm film is ten minutes.

Film "It's Only Beginning" is available on a free loan basis from Scientific Apparatus Makers Assn., Dept. CP, 20 N. Wacker Dr., Chicago 6, Ill.

For more information on product at left, specify CP 5754 . . . see information request blank between pages 2 - 3.

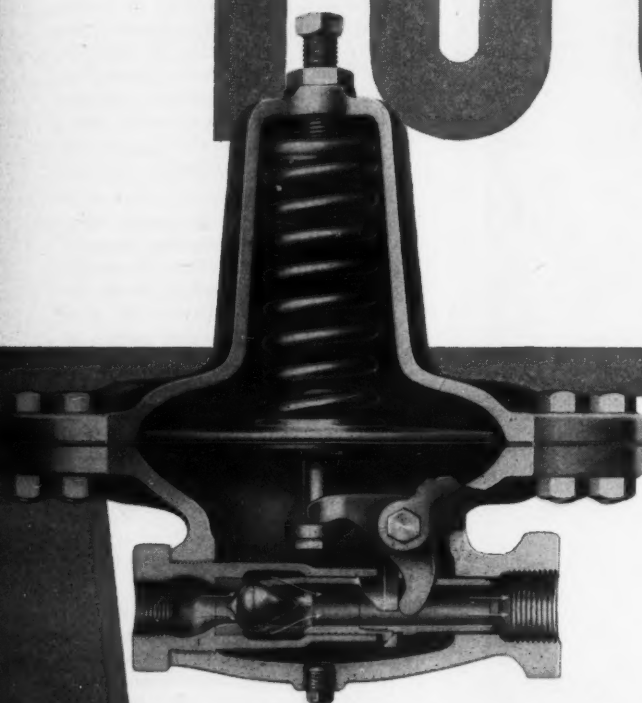


Fabricating Ampco Metal with Inert Gas Consumable Electrode welding.

* TYPE

1000

VALVE



Any product of quality should be dependable when ordinary products fail. Sudden pressure fluctuations, dirt, scale and viscous matter prove "fatal" to ordinary pressure reducing valves.

The CASH STANDARD TYPE 1000 VALVE however, is designed to operate with complete dependability under the

most difficult and unusual circumstances. Many of these units have been in service over 10 years and have never been taken "out of the line."

Truly an EXTRAORDINARY achievement of quality and design excellence.

* INSTALL CASH STANDARD "TYPE 1000" VALVES

CASH STANDARD

A. W. CASH COMPANY

DECATUR, ILLINOIS

IDEAS

(Continued from page 44)

commonly used. Information from test indicates whether addition of phosphate fertilizer will produce increased crop yields. Test is the first reported to give satisfactory results with a wide range of soil types in the Western states.

Method is based on reaction of calcium phosphates in soil and influence of these reactions on plant uptake of phosphorous. Test can be made in less than an hour. Measure of soil phosphorous available to plants is obtained by shaking soil with a solution of sodium bicarbonate.

(Information furnished by Agricultural Research Administration, United States Department of Agriculture.)

Low viscosity is feature of cellulose polymer

As a film former in lacquers, half-second cellulose butyrate has low viscosity characteristics.

In range of 10 to 40% polymer in a balanced solvents system, logarithmic relationship exists between per cent solids concentration and viscosity build-up. In general this viscosity is lower than other cellulose polymers.

(Product of Eastman Chemical Products, Dept. CP, 260 Madison Ave., New York 16, N. Y. . . . or for more information check CP 5755 on handy form, pages 2 & 3.)

Lifting ban on nickel makes alloy available

Lifting of ban limiting use of nickel makes the heat resistant alloy, NA22H, generally available. Alloy can be used at temperatures up to 2200° F.

(Courtesy of Blaw-Knox Co., National Alloy Div., Dept. CP, 2042 Farmer Bank Bldg., Pittsburgh, Pennsylvania.)

For more information on product at left, specify CP 5755A . . . see information request blank between pages 2 - 3.

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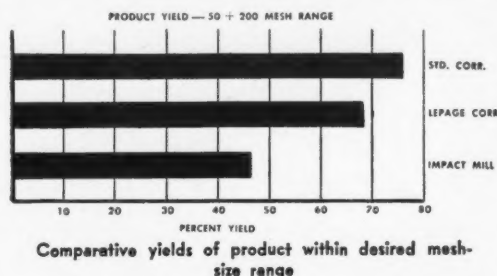
JANUA

Roller mill delivers particles whose shape is just like impact mill's product . . .

but tests show that rolls give higher yield within desired range of mesh sizes

Preliminary comparative testing indicates that a roller mill, under properly controlled conditions, can duplicate the particle shape obtained in a hammer-mill when the feed is a friable material. What's more, the yield of material in a chosen particle size range is quite a bit higher for the roller mill.

This could be important to processor's size-reducing materials where the shape of particles within certain limits has a pronounced effect on the product or the service it is to render after grinding. For instance,



the product may be intended for use as an absorption medium or it may be a plastic or other material which will be molded. In either case, particle shape can be extremely important.

For the test work, roller mills with two different types of corrugation were used — standard and LePage. In the first, both rolls have longitudinal saw-tooth corrugations which have a slight degree of spiral. In the LePage type, one roll has the longitudinal corrugations while the other has "V" cut corrugations around its circumference.

Rolls were spaced and hammermill screen selected to produce a maximum yield of minus 50 plus 200 mesh product. Under these conditions, the typical results shown in the table were obtained. Highest

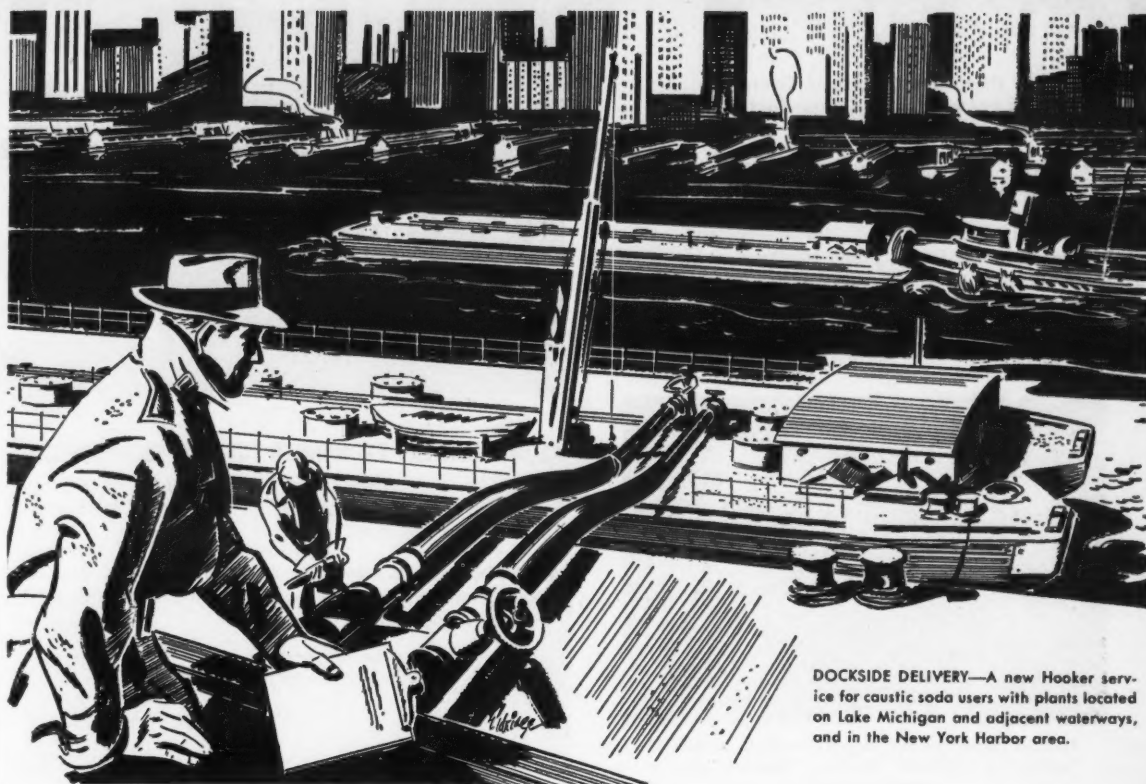
Product Yields with Three Grinding Methods

USS Mesh	Standard Rolls	LePage 8 Rolls	Impact Mill
+ 30	0.0	0.0	17.3
+ 50	8.1	12.9	15.3
+100	62.7	54.8	27.1
+200	13.2	13.6	19.1
-200	16.0	18.7	21.2

yield of material within the desired mesh sizes was obtained with standard corrugations (76%), while LePage corrugations gave a 68.5% yield, and the impact mill gave 46%.

However, particles obtained with standard corrugations were slivery and had ragged edges, while those from the LePage cut rolls and the impact mill were identical, being cubical and without slivers.

(Reported from paper by H. D. Vanderlip, Process Machinery Department, Allis-Chalmers Manufacturing Company, Milwaukee 1, Wis.)



DOCKSIDE DELIVERY—A new Hooker service for caustic soda users with plants located on Lake Michigan and adjacent waterways, and in the New York Harbor area.

For safe, sure, consistent results . . .

STANDARDIZE on Hooker Caustic Soda

Why this is important to you:

With *uniform* caustic soda coming in, shipment after shipment, you can standardize your caustic handling and processing.

You need not adjust your process to meet variations in incoming caustic shipments. You can be sure each new shipment matches your current inventory.

You get this kind of uniformity with Hooker Caustic Soda. Every step in the manufacture—from salt brine to tank car—is controlled at Hooker, by Hooker. More than 20 separate inspections and analyses safeguard the uniformity of the Hooker Caustic you buy.

This is one reason why leaders

in 30 industries specify *Hooker* Caustic—and why many have specified it for nearly 50 years.

Hooker uniformity can pay off for you, too—in lower operating costs and smoother, better processing. Try it and see. A letter or phone call to the nearest Hooker office will bring you product data and contract information.

Buy the UNIFORMITY Hooker Caustic Soda gives you

Forms: Liquid 50% and 73% • Flake • Solid • Special fine flakes
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From the Salt of the Earth

HOOKER ELECTROCHEMICAL COMPANY

When inquiring check CP 5756 on handy form, pgs. 2-3

HOOKER ELECTROCHEMICAL COMPANY 15 Forty-Seventh St., Niagara Falls, N. Y.

Please send ☐ data sheets on Hooker Caustic Soda; ☐ Bulletin 100 describing Hooker products and services.

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**National Distillers Chemical Company
improves voltage and power factor
with shunt capacitors . . .**

problem of harmonic currents is encountered and solutions suggested

At the Ashtabula, Ohio plant of National Distillers Chemical Co., voltage and power factor of Ignitron rectifier installations have been improved through the application of shunt capacitors. The problem of harmonic currents in the capacitors was encountered and means provided to overcome their



Rectifier installation that supplies power to production facilities at National Distillers Chemical Co. in Ashtabula, Ohio

effects. For this reason it seems in order to review the effects of harmonic currents, point out symptoms that indicate their presence, and suggest solutions to the problem.

Capacitors do not generate harmonic voltages themselves but they do provide a current path for such voltages coming from other equipment. Small harmonic voltages can cause large capacitor currents to flow. Order of harmonic voltages that appear on AC side of rectifiers depends on number of rectifier phases.

Capacitor units are designed to carry 135% of nameplate kva rating. A reasonable harmonic current in addition to fundamental is therefore not harmful. At National Distillers the capacitor bank was added for power factor correction and to raise the voltage on the 13.8 kv bus supplying the 40,000 amp, 650v, 12 phase Ignitron rectifier installation. Rated current of the 5100 kva capacitor bank is 214 amp.

Presence of harmonic currents in the capacitor bank was detected from high ammeter readings in the capacitor circuit. On one occasion, a maximum capacitor current of approximately 185% of rated current was measured with breaker No. 1 open and breakers 2 and 3 closed, and the over-current relay tripped off the capacitor bank. Had all of the harmonics present been generated by the 12 phase rectifier, the 11th and 13th harmonics would have been predominant.

With this information and other considerations, a harmonic analysis was made. By use of a formula, kvar loading was calculated to be 120% of rated value, which allows a reasonable margin below

YOUR
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ALUMINUM HEAT EXCHANGER TUBES SAVE UP TO 80%

Alcoa Aluminum Tubes cost far less than other metal tubes . . . 1/2 the price of Admiralty, 2/3 the price of Mild Steel, 1/5 the cost of Stainless!

An average-sized refinery can save \$50,000 in first cost by using Alcoa Aluminum Tubes (figured on 20,000 tubes) as this chart shows:

	PRICE PER 16 FOOT LONG TUBE			
	3/4" O.D. x .049" wall	3/4" O.D. x .049" wall	3/4" O.D. x .065" wall	1" O.D. x .065" wall
3S-H14	\$1.31	\$1.50	\$1.82	\$2.37
Alclad (inside) 3S-H14	1.66	1.92	2.28	3.02
Seamless Mild Steel	2.68	2.82	3.18	3.49
Admiralty Brass	3.31	3.94	5.00	6.68
Cupro Nickel (30%)	4.87	5.71	7.46	10.03
Stainless Steel (304)	8.61	9.67	11.38	13.73

NOTE: All prices are approximate. Prices for 3S-H14 and Alclad 3S-H14 based on lots of 2000-4999 lbs., for Admiralty and Cupro Nickel 5000 to 9999 lbs. Prices for Mild Steel and Stainless based on lots of 10,000 ft. with exception of size 1" O.D. x .065" wall which is based on 5000 ft.

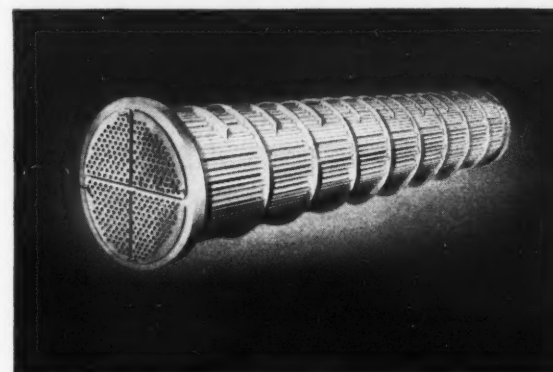
ALUMINUM TANK CARS SAVE UP TO 33 1/3%

Tank cars made of Alcoa Aluminum cost one-third less than stainless steel tank cars—savings well worth your investigation!

Aluminum does not contaminate or discolor sensitive liquids—does not promote decomposition. Result: no damage to ladings, better end products. Aluminum is highly resistant to most corrosive ladings—requires far less maintenance than other metals.

Alcoa pioneered the aluminum tank car more than 25 years ago . . . and that original car is still hauling fatty acids. There's proof that aluminum resists corrosion, gives lasting service, doesn't contaminate its cargo. If you want further

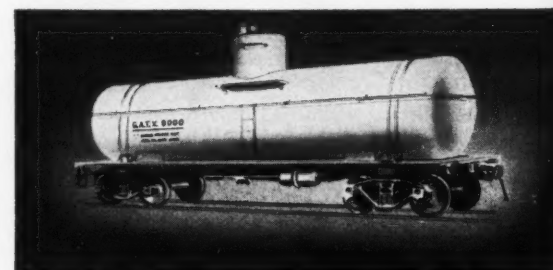
ALCOA
belongs in



Further savings in handling and shipping, as well as excellent low temperature properties and resistance to corrosion—make Alcoa tubes the best buy, by far, for many heat exchanger applications.

Let us tell you more about the unusual savings you can make with Alcoa tubes. Write for the free booklet, *Alcoa Aluminum Heat Exchanger Tubes*.

proof, ask your car builder about the advantages of lightweight aluminum rolling stock. Or better still, write Alcoa. We have gathered facts and figures on literally hundreds of liquid ladings that can be safely, economically shipped in aluminum. Ask us about your commodity today.



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ALUMINUM COILED TUBE SAVES UP TO 40%

ALCOA UTILITUBE* is aluminum coiled tube made of a specially selected alloy to provide low cost, easy workability and high fatigue strength.

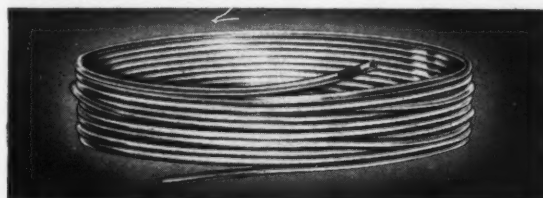
Alcoa Utilitube offers savings up to 40 per cent over copper . . . has excellent on-the-job forming and flaring properties. It is available in economical, long lengths up to 1,000 feet or more, depending on size. It stands up well under vibration . . . has high resistance to most industrial atmospheres and to many liquids and gases.

*Registered Trademark, Aluminum Company of America

Use Alcoa Utilitube for:

- PNEUMATIC CONTROL CIRCUITS.
- GASOLINE AND FUEL OIL FOR INTERNAL COMBUSTION ENGINES.
- LUBRICATING OILS FOR ENGINES AND MACHINES.
- FLUIDS FOR HYDRAULIC SYSTEMS.

For complete details, write for the booklet, *Alcoa Utilitube*.

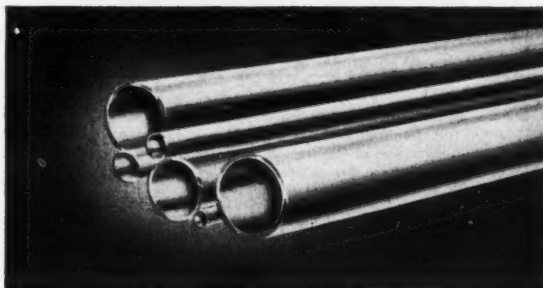


ALUMINUM PIPE IS THE LOWEST COST CORROSION-RESISTANT METAL PIPE.

Alcoa Aluminum Pipe and Fittings offer tremendous advantages to the chemical, petroleum and food processing fields. It is equally applicable for oil, gas, water, compressed air and mine drainage pipe lines. Structural uses, too, have become increasingly popular, especially in outdoor areas subject to corrosive fumes or salt spray.

Aluminum pipe, of course, is highly resistant to attack by hydrogen sulfide in sour crude and most other sulphur compounds . . . protects the quality of high-grade resins and other naval stores. It can be joined by every fusion process . . . is easier to handle and install because it only weighs 1/3 as much as other metal pipe. Its chemical inertness and corrosion resistance avoid batch and process contamination. High thermal conductivity and ductility speed filling of vessels with cold liquids.

You get all these cost-cutting qualities when you use Alcoa Pipe in the processing field. Write for the booklet, *Alcoa Aluminum Pipe and Fittings*.



For process chemicals, catalysts, catalyst carriers and desiccants, investigate Alcoa Chemicals.

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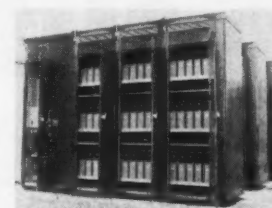
I would like more information on:

- ☐ Alcoa Heat Exchanger Tubes ☐ Alcoa Utilitube
☐ Alcoa Aluminum for Tank Cars ☐ Alcoa Aluminum Pipe
☐ Alcoa Chemicals

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____

When inquiring check CP 5757 on handy form, pgs. 2-3

permissible kvar of 135%. In this way it was shown that the capacitors are not being overloaded. Relay setting of the overcurrent relay associated with the breaker controlling capacitor bank was increased from 400 to 450 amp to prevent unnecessary tripping. After it was determined that the capacitors at National Distillers were operating within their thermal limit, another 2400 kva bank was added to further



View of outdoor capacitor bank added to provide voltage and power factor improvement

improve power factor and voltage conditions. However, this did not change effect of harmonic currents. Approach to the problem in any installation involving any number of rectifier phases would be similar. In some cases it is not necessary to make a harmonic analysis.

(Courtesy of Westinghouse Electric Corp., Dept. CP, P. O. Box 2278, Pittsburgh 30, Pa. . . . or check CP 5758 on handy form, pages 2 and 3.)

Conventional molds OK for silicone rubber . . .

total linear shrinkage of merely 3% allows use of molds intended for natural, synthetic rubber

Silicone rubber parts can now be produced in molds originally designed for natural and synthetic rubber parts since the development of a low compression set rubber with only half the shrinkage after molding of conventional silicone rubber compounds.

Recommended particularly for capacitor bushings and for O-rings and packings in engines where gaskets and seals must remain effective under sustained pressure, the new compound has a compression set of only 8% after 22 hours at 300°F as compared with nearly 100% for organic rubber and about 75% for general-purpose silicone rubber. Its water absorption is an unusually low 1% after immersion for 1 week at 70°C.

The new silicone rubber is designated SE-360 and can be used to produce highly uniform parts from ordinary rubber molds. It has a total linear shrinkage of 3% after oven cure. Similar compounds generally shrink 6% or more. This low shrinkage feature is expected to effect a saving in the amount of compound required. Conventional press cycle of about 15 minutes at 250°F can be used, followed by a 24-hour oven cure at 480°F to obtain the required physical properties.

SE-360 silicone rubber is currently available as a 60 durometer compound. It can be used as a base stock and modified to yield 70-80 durometer compounds. (Product of the General Electric Company, Dept. CP, Pittsfield, Massachusetts.)

Technical data on the revolutionary new

holo-flite*

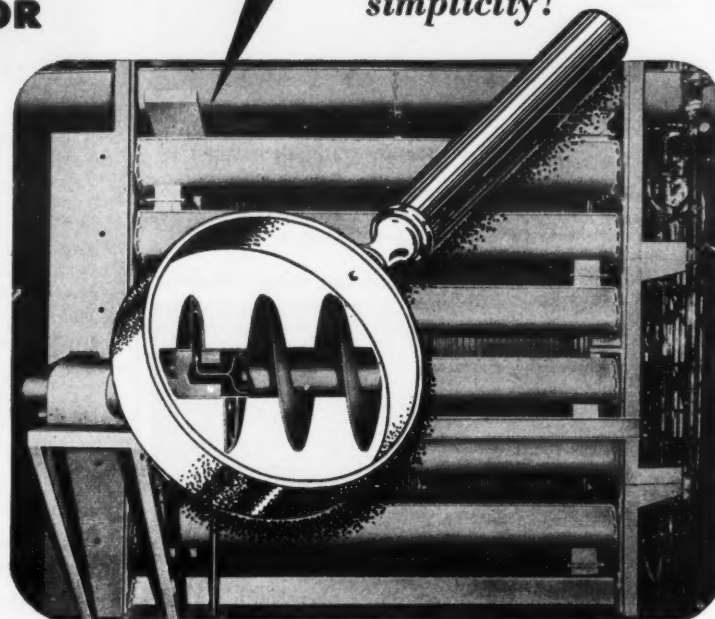
(HOLLOW-FLIGHT)
PROCESSOR

If you have processing operations where slurries, solids, pulps or pastes must be cooled or cooked, be sure to investigate the many unique advantages of the newly-developed HOLO-FLITE Processor before you install any heat-exchange equipment.

Here's the HOLO-FLITE principle...

Two or more screw conveyors rotate slowly in a trough. The blades and shaft of each flight of conveyors are hollow, with provision for circulating the heat-transfer agent through them. The product to be cooled or cooked is moved along the trough, being constantly rotated into, around, over and under the conveyor screws as it moves.

Thus, a continuous thermal transfer takes place between the product and the heat-transfer fluid circulating in the blades. The product is cooled or cooked in continuous-flow without the "stop-and-go" losses of batching operations... and cooled products can be packaged directly from the HOLO-FLITE discharge—saving space, time and additional handling.



THIS 6-TIER HOLO-FLITE cools 7 tons of cottonseed press cake per hour from 285° to 89°F. in a total floor space of only 28 sq. ft.
(Inset) Enlarged cutaway view of HOLO-FLITE screw showing heat-transfer principle.

Here are typical HOLO-FLITE advantages

The HOLO-FLITE principle is so unique it is setting completely new standards of performance in many ways. For example...

*Reg. T.M.

The HOLO-FLITE Saves Space
—It requires as little as 1/5th the space of other units of comparable capacity because (1) it has far greater heat-transfer area per cubic foot of space... and (2) the flights can be "tiered" as high as desired to give maximum capacity in very small floor areas.

The HOLO-FLITE is Versatile
—Processed product can be fluid, pulp or paste—granular, crys-

talline or powdered solid. Heat-transfer fluid can be refrigerant, cooled or ambient water, steam, oil or any other desired fluid, at any normal temperature range.

The HOLO-FLITE is Dust-Free
—Its gentle action provides large heat-transfer action without dust and with negligible particle abrasion. Simplifies installations, assures higher quality product.

The HOLO-FLITE is Adaptable
—It can easily be designed to handle virtually any capacity by (a) varying the diameter of the screws (7" to 16")... (b) varying the length of the screws (8 ft. to 20 ft.)... (c) varying the number of intermeshing screws per trough (2, 4, or 6)... and (d) varying the number of tiers stacked on top of one another (1 to 10, or more)

The HOLO-FLITE is in daily operation on such typical products as sand, cement, cottonseed cake, soybean meal, borax, salt, sugar, baby foods and many other equally-varied products.

What is your problem? Our engineers will be glad to assist you in making the most of HOLO-FLITE advantages. Write wire, or phone the office nearest you!

Want More Facts? This 8 page booklet describing the HOLO-FLITE in greater detail will gladly be sent on request. No obligation, of course.



IDEAS

To study nuclear power plants for high cost power areas

A contract was recently awarded by the Atomic Energy Commission to Walter Kidde Nuclear Laboratories, Inc., Garden City, L.I., N. Y. to make a design study of "a nuclear power plant for use in an isolated high-cost power area." Study will concentrate on a nuclear power plant of 30,000 kw capacity. The plant would be a "single purpose" reactor designed to produce power only, and it would use light water as a moderator and as a coolant.

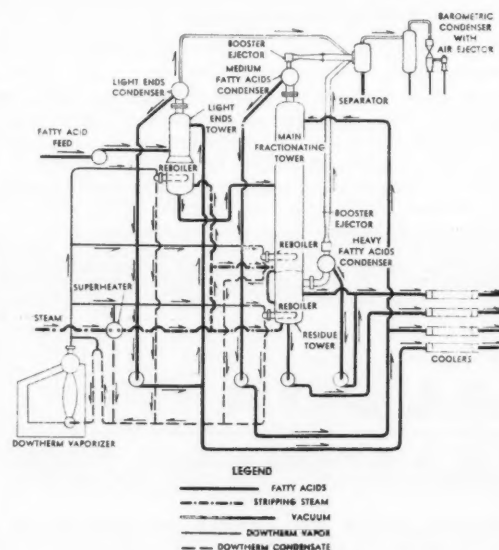
Contract between the AEC and the Kidde organization calls for a detailed cost analysis to cover architect-engineer costs, construction costs and operating costs for a four-year period following start-up of the plant. The contract also specifies that the study point out the effect of site location upon reactor design and power plant. Study is expected to be completed late in 1953.

(Courtesy of Walter Kidde Nuclear Laboratories, Inc., 975 Stewart Ave., Garden City L. I., N. Y.)

Plant produces fatty acids from fish oils and other feed stocks...

distillation system produces four fractions which may be blended to specified mixtures

Early last year Sandar Fabrikker A/S, in the small Norwegian port town of Sandefjord, started operating a plant for producing fatty acids from fish and whale oil. The versatile installation can also process other stocks such as palm kernel, tallow, cottonseed and others. It is based on Armour & Company patents for fractional distillation of fatty acids.



Simplified flow diagram of fatty acid fractional distillation system at Sandefjord, Norway

One of the key parts of the plant is the fractionating still system (explained in diagram) which has a feed capacity of 30 tons/day, and is fed from one of three 132,000 gal storage tanks. The still gives four fractions: 1) odor and color fraction, 2) low molecular weight fraction, 3) high molecular weight fraction, and 4) residue. Accompanying table gives some results of a typical mixed-fish-oil run.

If desired, one or all of the fractions may be run through the still a second time. In this way, it is possible to obtain high-purity myristic acids, palmitic acids and so on. Alternately, blended fatty acid mixtures of known composition and having particular properties may be produced.

Fractions from the still are received in 14 aluminum tanks, each having a capacity of 26,420 gal. These

Typical Results of Fractionating Mixed Whale and Herring Oil Acidulated Fats

	Per Cent	Acid Value	Iodine Value
No. 1 Fraction	8	237	33
No. 2 Fraction	40	210	80
No. 3 Fraction	40	181	194
Residue	12	55	162

Note: Feed stock has acid value of 181, iodine value of 135. Still is operating at feed rate of 4000 lb/hr.

tanks have external heating coils beneath their bottom spherical heads. The fatty acids are then pumped to the flaker or to block-molding.

Since Sandar's raw materials are of such diversified origin, high-pressure batch splitting (instead of continuous splitting) is employed. Before splitting, raw stock is refined by dilute sulfuric acid and is then washed with water. Two centrifuges remove the water from the oil.

(Splitting and fractional distillation systems were supplied by Foster Wheeler Corporation, Dept. CP, 165 Broadway, New York 6, N. Y.)

Deals with industrial applications of atomic energy, radioisotopes

Some practical problems in applying atomic energy in industry are outlined in a compilation of papers presented before the Spring Manufacturing Conference of the American Management Association. One report discusses the status of the atomic energy industry, reviewing the military program and various peaceful applications. Applications of radioisotopes in gaging, marking (tracer uses), wear tests, and other miscellaneous uses are described in a second paper. The position of the manufacturer in atomic energy and what atomic energy means to industry are discussed in the concluding reports.

To obtain a copy of Manufacturing Series, No. 210 — "Industry Enters the Atomic Age", members should remit \$1.00 (\$1.25 to non-members) direct to American Management Association, 330 W. 42nd St., New York 36, N. Y.

You'll save time and trouble on H.P. VESSEL GASKETS



...when J-M Goetze gasket specialists make them for you

When you need gaskets such as those above, which were made for pressure vessel service over 5000 psi, consider this. It takes less time and trouble to turn the job over to J-M Goetze — an organization that has specialized in gasket design and manufacture for 67 years. And it usually costs less in the long run.

Goetze engineers can select the right style for maximum sealing efficiency. They know the correct metals and other factors required for efficient, long-lasting gaskets.

Goetze Gaskets are made exactly to the last detail of your specifications and conditions. They are made to craftsmen's perfection . . . with modern machine tools, some of which were specially designed by Goetze for gasket manufacture.

If you need gaskets for high pressure vessels or similar applications, send us a drawing or template for quotation. Or write for further information to Johns-Manville, Box 60, New York 16, New York.



Johns-Manville Goetze GASKETS

THERE'S A JOHNS-MANVILLE PACKING AND GASKET FOR EVERY SERVICE

When inquiring check CP 5760 on handy form, pgs. 2-3

BIDDLE Instrument News



NEW...

**SPEED MEASURING
BOOKLET
For
PRACTICAL
MECHANICAL
MEN**

Cut-away drawings show how the phenomenon of resonance is applied to the measurement of speed through the use of a set of tuned steel reeds mounted in a case with a scale calibrated in rpm. Complete range of instruments is described.

IF YOU WANT QUICK, ACCURATE READINGS WITH SAFETY

Don't overlook the advantages of FRAHM® RESONANT REED TACHOMETERS for hand or permanent mounting.

No contact with moving parts is required. Just touch the instrument to the chassis, frame or housing of the machine or motor and read the rpm directly.

There are no moving parts, hence no lubrication or maintenance is required. Accurate to 1/2 of 1%, they will operate continuously for years without any appreciable change. Instruments with limited ranges available for as little as \$27. Practically any desired range within 900 and 100,000 rpm can be supplied.

Write for BULLETIN 31P8-CP.



JAMES G. BIDDLE CO.

**ELECTRICAL TESTING
INSTRUMENTS**

**SPEED MEASURING
INSTRUMENTS**

**LABORATORY & SCIENTIFIC
EQUIPMENT**

1316 ARCH STREET, PHILADELPHIA 7, PA.

James G. Biddle Co.
1316 Arch St., Phila. 7, Pa.

Gentlemen:

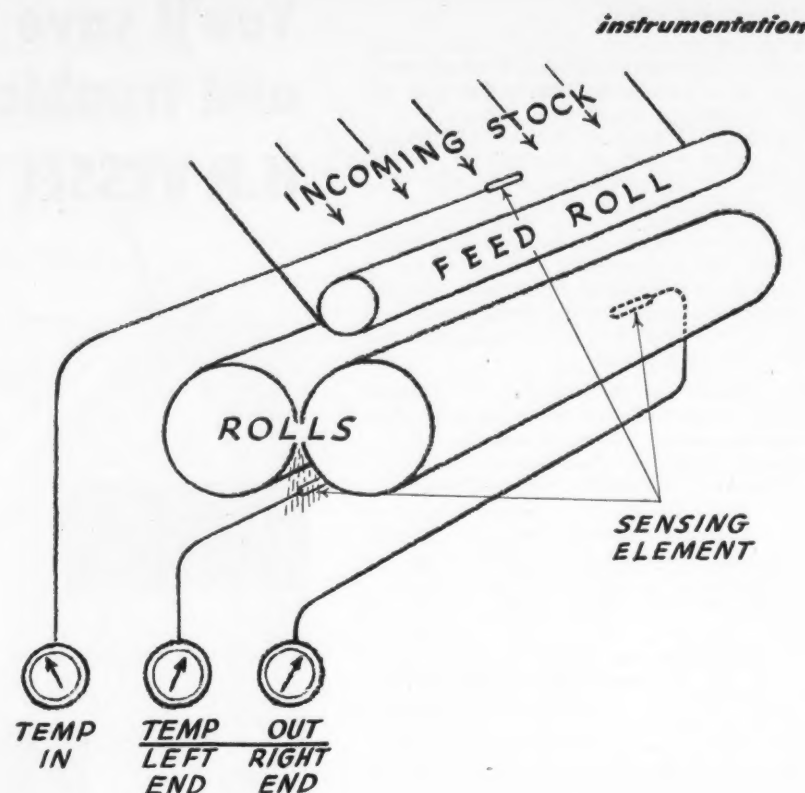
Please send me Bulletin 31P8-CP.

NAME

JOB FUNCTION

COMPANY

ADDRESS

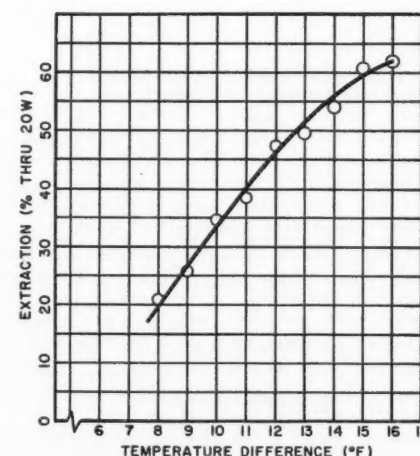


temperature rise is key to milling performance

Take temperature of material before and after pass through rolls to get a line on roll setting, efficiency

Atkinson Milling Company of Minneapolis has applied for patents on its idea for controlling milling processes. Until about two years ago, they used the conventional method of determining optimum settings for milling flour — the operator's judgement of the "feel" of the milled product. Part of this judgement was based on the temperature of the stock after passing through the rolls.

Because even slight adjustments of roll pressure caused changes in the temperature rise — though frequently too small to be noticed by "feel" — Atkinson tried the



Sketch shows location of temperature elements. Note smallness of deviations in this plot of extraction (degree of fineness attained) against temperature rise

When inquiring check CP 5761 on handy form, pgs. 2-3

experiment of making actual temperature readings. Their tests have shown that the roll pressure change could be followed by temperature measurements and that the degree of fineness attained could also be predicted.

Furthermore, they found that there are these advantages to checking temperature rise:

- 1) Uniformity of grinding from shift to shift
- 2) Ease of rapid inspection of roll settings
- 3) Condition of roll surfaces easily ascertained
- 4) Longer roll surface life
- 5) More uniform flow of mill streams
- 6) Lower power consumption, more uniform use of power
- 7) Less wear on equipment, belts, bearings

So far as is known, the Atkinson installation is the first case where temperature readings on the material being processed have been used for machine adjustments. The men who worked on its development feel that the principle can be applied wherever there is a temperature rise due to size reduction. (Such systems are reported to be under development by a large instrument manufacturer.)

Outline of Work Done

At first, temperature measurements were made by inserting ordinary thermometers in containers of the stock before and after milling. Because of the time element and inaccuracies of readings with the method, indicating thermometers were installed above and below the rolls as shown in sketch. More accurate readings with this system established the relation between temperature rise and degree of fineness or extraction.

Results of one test are shown in curve. Generally, per cent extraction for any material increases with temperature rise. Other tests show that grinding will be uniform across roll when temperature rise at each end is the same.

Effect of dull rolls on temperature rise and extraction was studied by taking data before and after a roll change. Average temperature difference for two weeks preceding roll change was 15°F. With the same extraction after changing rolls, temperature difference for the next two weeks averaged 8°F.

Power consumption can also be measured by the temperature difference approach. In tests, an increase of 3.5°F temperature difference was accompanied by a 15% increase in power consumption. But more important — after the installation of temperature checking, power consumption in milling operations dropped 10%.

(Temperature rise studies were conducted by Atkinson Milling Co., Dept. CP, 900 Flour Exchange, Minneapolis 15, Minn. . . or for more information check CP 5762 on handy form, pages 2 and 3.)

Convention & Exhibit Schedule
appears on page 173 of this issue.

WHAT'S NEW AT BRISTOL WHAT'S NEW AT BRISTOL

Meet the WORLD'S SIMPLEST INSTRUMENT SYSTEM!

It's Bristol's new METAGRAPHIC pneumatic transmission instrument system, for measuring, indicating, recording and controlling pressure, temperature, vacuum, flow, differential pressure and liquid level.

HERE ARE THE BIG ADVANTAGES OF THE NEW METAGRAPHIC SYSTEM:

1. **SIMPLICITY** — fewer parts, fewer adjustments, and less service required. Range changes can be made in seconds.
2. **FLEXIBILITY** — units can be combined like building blocks to make any kind of arrangement.
3. **TRUE PLUG-IN SERVICE** — results in great savings in installation costs; units can be plugged in or out without stopping process or control.
4. **NO TIME LAGS** — in a four-pipe circuit the transmitter signal and controller-output signal travel around a short loop — as small as three feet.

Get the whole METAGRAPHIC story by writing to
The Bristol Company, 141 Bristol Road, Waterbury 20, Conn.

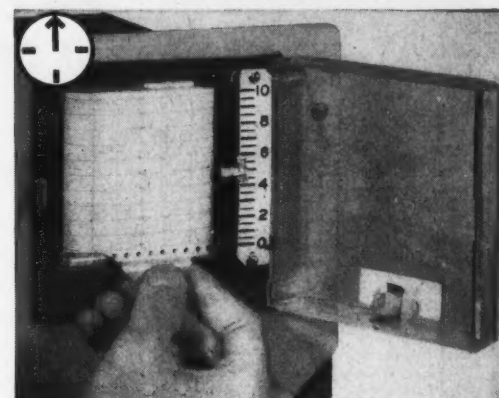
LOOK FOR OUTSTANDING NEW
DEVELOPMENTS FROM BRISTOL

BRISTOL

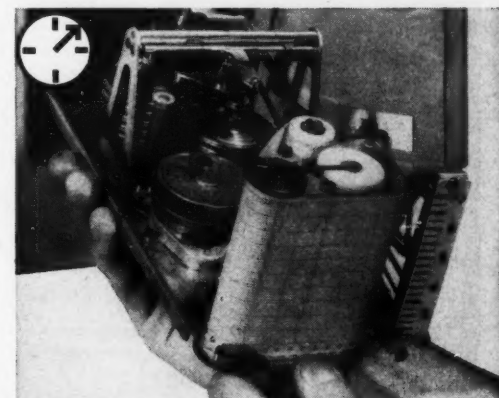
THE DEPENDABLE GUIDEPOST OF INDUSTRY
AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

When inquiring check CP 5763 on handy form, pgs. 2-3

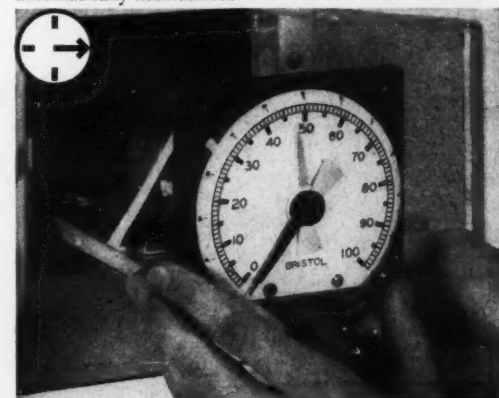
It takes only fifteen seconds to
change the Bristol METAGRAPHIC
recorder to an indicator!



Case door is opened.



Recorder chassis is withdrawn from case. Air pressure is automatically maintained.



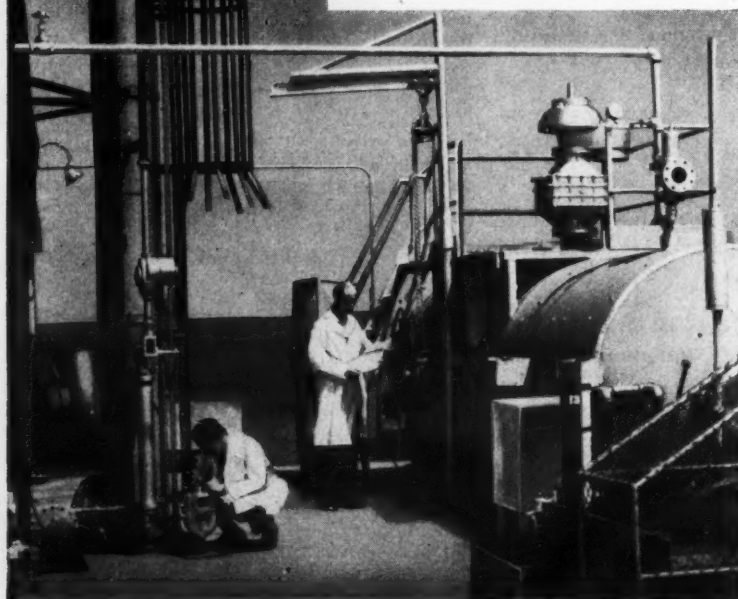
Indicator chassis is plugged into same case.

"Varec" meets the Challenge of Obsolescence!

The PETRO-CHEMICAL INDUSTRY is a dynamic one—continuously changing and constantly expanding to boost output and produce better products. This creates a high rate of obsolescence that demands new equipment designs and new material applications for replacements.

Vapor Recovery Systems Company is timing its production to meet this demand. Our Engineering department is continually testing new and better designs, seeking the finer quality parts, and adopting the most corrosive-resistant materials available to contribute to the progress of industry.

Whether you are installing or improving your TANK EQUIPMENT—GAS CONTROL DEVICES—GAUGING SYSTEMS, you'll find the "VAREC" line prepared to do the job in a better way.



THE VAPOR RECOVERY SYSTEMS COMPANY
2820 NORTH ALAMEDA STREET • COMPTON, CALIFORNIA
Manufacturers of "VAREC" Equipment
Representatives in Principal Cities of the World

When inquiring check CP 5764 on handy form, pgs. 2-3

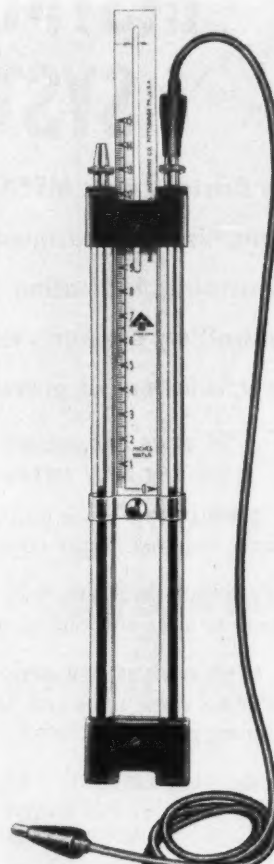
INSTRUMENTATION

Slide scale to speed pressure reading . . .

manometer reads directly to
tenth of an inch of water

Uses: For direct reading of
static and differential pressures to
15 inches of water.

Features: Plastic manometer
scale slides to align with lower



0 to 7 or 0 to 15 inches of water

liquid level. Difference of level
is then read directly.

Description: Manometer is
built in two ranges: 0 to 7 and
0 to 15 inches of water. Higher
range has a reversible scale to
also read 0 to 8.5 ounces per
square inch. Body of instrument
is extruded, high-strength plastic.
Scale is white opaque plastic.

(Direct Reading Manometer is a
product of Bacharach Industrial
Instrument Co., Dept. CP, 7301
Penn Ave., Pittsburgh 6, Pa. . .
or for more information check CP
5765 on handy form, pages 2 & 3.)

AIR POLLUTION



Study Of Meteorological Conditions Above New Plant Site Urged

Looking for a new plant site? To buy or build? Then
take the word of industrialists and scientists, who are
using the newest techniques in the study of air con-
taminants:

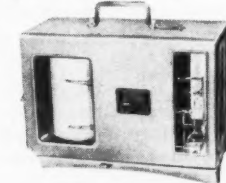
Study the meteorological conditions at various alti-
tudes as well as ground level.

Knowledge of temperature, humidity, time, windspeed
and direction can save you money.

Bendix-Friez, foremost maker of meteorological
instruments in the world, offers all its facilities and
experience with industries, to help you find a practical
approach to minimize your air pollution problems . . .
now or before they start without costly moderation of
present equipment. Write for further information.



AEROVANE indicates and records
windspeed and direction. Recogn-
ized as "best all-purpose wind
measuring instrument yet de-
vised." Readily installed and
easily maintained.



HYGRO-THERMOGRAPH The
leader in its field. Noted for
precise accuracy and long-time
dependability. Records relative
humidity and temperature on
one graph.



FRIEZ INSTRUMENT
Division of



1450 Taylor Ave., Balto. 4, Md.

EXPORT SALES

Bendix International Division
205 E. 42nd St., New York 17, N.Y. U.S.A.

When inquiring check CP 5766 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Semi-portable, gas analyzer
operates continuously,
acts as warning . . .**

using electroconductivity, it detects any gas ionizable in water

Uses: In general, analyzer will detect gases which ionize in water, or which can be decomposed by heat into gases which ionize. A variety of special-purpose equipment based on this analyzer is available.

Features: Sensitivity to some common gases is very high: 5 ppm SO₂, 10 ppm Cl₂, 50 ppm CO₂

in nitrogen all produce full-scale deflection. Instrument will also detect difficult to trace gases such as carbon tetrachloride fumes, methylene chloride, etc.

Description:

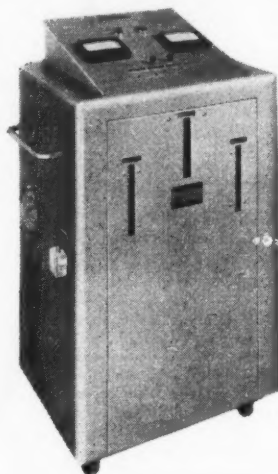
Specially designed units are in operation in a variety of situations including process control, leak detection, air pollution, solvent recovery, and so forth. Heart of each of these systems is the analyzer itself which continuously measures gas concentration.

A stream of distilled water passes through reference electrodes and then is mixed with gas sample. After mixing, stream passes over measuring electrodes. Continuous output shows change in conductivity which is proportional to concentration of gas being measured.

Where concentration is low, water is continuously recirculated through ion-exchange resins to remove ions picked up. In process control instruments, continuous supply of distilled water is needed. This can be facilitated by a small still built directly into the instrument unit.

Three basic instrument types are the permanent recording continuous analyzer which has a built-in round-chart recorder, the semi-portable analyzer (shown), and a tube sampling analyzer. Latter instrument samples several remote points and may be used with a multi-point strip chart recorder. Manufacturer prefers to have complete details of proposed use. Instrument is then designed to conform with requirements. Thus user does not need to face design complexities of a proposed system.

(Continuous Gas Analyzers are products of Instrument Div., Davis Emergency Equipment Co., Dept. CP, 47 Halleck St., Newark 4, N. J. . . . or for more information reader may simply check CP 5767 on convenient Reader Service slip located between pages 2 and 3.)



**Do YOU have
operations
similar to these?**

*Then check the
extra savings possible
with industry's great
new profit-builder -*

Arnold O. Beckman OXYGEN CONTROL!

Where others are cutting costs, boosting profits . . .

► **Boilers, Direct Fired Heaters or Stills, Rotary Kilns**

Arnold O. Beckman Oxygen Measurement on Flue gases insures greater savings through optimum combustion efficiency, lower fuel costs.

► **Hydrogenation, Hydrofining, Gas Compressors, Sulfur Grinding**

Arnold O. Beckman Oxygen Control in explosive atmospheres protects lives, prevents costly damage, reduces fire risks.

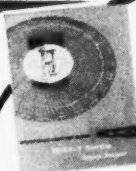
► **Air Liquifraction, Production of Acetylene, Butadiene and Similar Gases**

Arnold O. Beckman Oxygen Measurement insures higher product quality through minimum oxygen or air contamination.

► **Resin Kettles, Color Pigments, Product Storage**

Arnold O. Beckman Oxygen Measurement of inert purge systems minimizes oxidation, protects product standards.

Send For
This Helpful Data -



BULLETIN 103:

Describes the Model G-2 Beckman Oxygen Analyzer — the instrument to use where maximum accuracy is essential. Model G-2 ranges are available for oxygen concentrations as low as 0-1000 parts per million — as high as 95-100% — or virtually any other range or combination of ranges. Bulletin 103 describes the unique magnetic operating principle used in Model G-2 Analyzers, equipment, accessories and typical applications.



BULLETIN 108:

Describes the Model F-3 Beckman Oxygen Analyzer — the instrument designed primarily for industrial applications such as combustion control, catalyst regeneration, sulfur grinding, etc., which require an oxygen measuring range of 0-5%, 0-10%, 0-15% or higher. Bulletin 108 describes the unique magnetic operating principle used in Model F-3 Analyzers, gives equipment specifications and typical applications for this instrument.

BULLETIN AD607: Contains helpful charts and data on most efficient methods of controlling various combustion processes.

BULLETIN AD610: Contains helpful data on Chemical Applications, illustrates a typical installation, lists equipment required.

BULLETIN AD611: Contains helpful data on Tunnel Kiln Applications, shows typical installation, details equipment required.

BULLETIN AD613: Contains helpful data on measuring O₂ content of High Purity Gases, shows typical sampling system, lists equipment required.

Want more details?

In addition to the applications highlighted above, there are many other processes where Arnold O. Beckman Oxygen Control brings new profits, new savings, new production efficiencies. Write for additional information, outlining your particular field of operation.

Arnold O. Beckman INC.

1020 Mission St., South Pasadena 20, California

Please send Bulletins checked below:

☐ 103 ☐ 108 ☐ 607 ☐ 610 ☐ 611 ☐ 613

Name

Company and Address

Position

CHECK THESE IMPORTANT ADVANTAGES OF ARNOLD O. BECKMAN OXYGEN ANALYZERS

DIRECT MEASUREMENT: Operating principle is based on unique paramagnetic properties of Oxygen. Arnold O. Beckman Oxygen Analyzers measure oxygen by direct physical means. No chemicals are required, no saturated atmospheres, no "hot wires" or other complex devices that may alter the composition of the sample gas.

HIGH ACCURACY: Readings are accurate within $\pm 1\%$ of full scale for spans of 2% O₂ and greater (e.g. .02% O₂ on 0-2% O₂ range). Accuracy is unaffected by ambient temperature variations.

LINEAR SCALE: Calibration of Arnold O. Beckman Oxygen Analyzers is strictly linear and the scale is accurate over the entire range.

SIMPLE SAMPLING: Only a small volume is necessary — 50-250 cc. per minute. Accuracy is not affected by variations in flow rate. Samples may be dry or saturated. Nothing is added to the sample, and it may be returned to the process unchanged. Many corrosive or reactive gases can be analyzed.

COMPLETELY AUTOMATIC: Sampling and measurement are continuous and automatic. No attendant is necessary.

RUGGED CONSTRUCTION: The unit is shock mounted to protect it from extreme vibration and shock. Maintenance is negligible—no chemicals, filaments, wicks, etc., to replenish—no orifices or glassware to clean and replace.

MANY RANGES: From a few parts per million to 100% O₂. Multi-range instruments are also available.

Your inquiries on oxygen measuring and control problems are welcomed. Please write directly to our head office giving data on the requirements of your particular application.

When inquiring check CP 5768 on handy form, pgs. 2-3

Another Beckman Achievement

BECKMAN Model W Industrial pH Meter

—A Husky New Addition to America's Most Distinguished Family of



INDUSTRIAL
CONTROL
INSTRUMENTS

New Savings—New Speed New Production Advantages

Beckman — pioneer of virtually every major advancement in pH equipment — now presents a significant new development in industrial pH instruments — the new Model W Industrial pH Meter.

This new industrial pH Meter takes advantage of modern electronic engineering, using miniature and sub-miniature tubes and printed circuits. It is only one-quarter the size of conventional pH instruments... and is designed to save maintenance costs by sturdy, moisture-proof construction. The instrument circuit is of a completely new Unitized design — made in three separate plug-in sections, any of which can be interchanged in the field to avoid downtime.

Whatever your industry, whatever your pH problem, get the facts about Beckman pH Control Instruments. Write for Data File No. 86 — 11.

Many New and Improved Features

ADVANCED DESIGN

Unusually compact, utilizing subminiature components and printed circuits.

ACCURACY

Signal to recorder accurate within ± 0.02 pH.

SIMPLIFIED MAINTENANCE

Easily disassembled for quick maintenance... plug-in units.

DEPENDABILITY

Unaffected by line voltage fluctuations, corrosive atmospheres, vibration, or electrical machinery.

SPLASH PROOF

Designed for high humidity and outside exposure conditions.

EXPLOSION PROOF

Can be used with air purge in explosive atmospheres. Heavy cast iron case available.

Beckman

division

BECKMAN INSTRUMENTS, INC.
SOUTH PASADENA 1, CALIFORNIA

When inquiring check CP 5769 on handy form, pgs. 2-3

INSTRUMENTATION & CONTROL

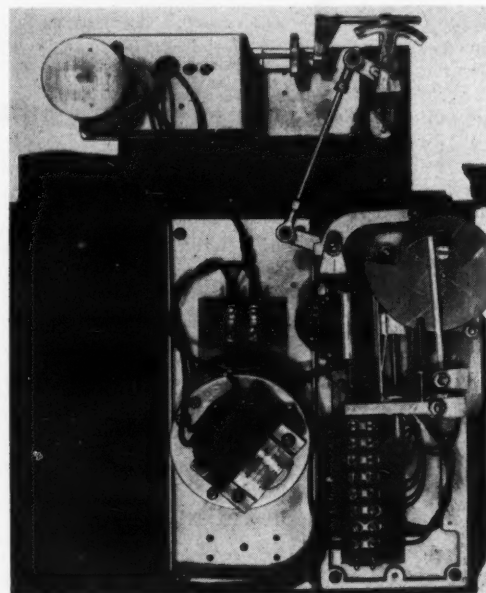
Two differential transformers employed in flowmeter

Uses: Records and integrates fluid flow.

Features: Null-balance electronic circuit is unaffected by voltage and frequency variations, temperature variation.

Description: Flow recorder is made up of three basic parts: transmission system, pen drive motor, and continuous integrator. Transmission system is made up of differential transformer located at transmitter, three-wire transmission circuit, receiving differential transformer and electronic amplifier. Movement of core at transmitter causes voltage to be induced in transmission circuit. Voltage is impressed upon input of amplifier. Output drives pen motor. Other winding of motor is connected to supply voltage. Pen-drive motor also repositions core and receiving coil of differential transformer. This electrically rebalances circuit. Thus amplifier input tends to remain balanced at zero.

Pen-drive motor is a reversing squirrel-cage type. Fully enclosed, it has a lubricated gear train. In



Precision cam can be seen at right

addition to driving pen and differential transformer coil, it positions a calibrated cam. Cam contour corrects square-root curve and is used to position pen.

Integrator is driven by synchronous motor and operates by means of two discs positioned relative to one another by cam follower. High accuracy is obtained continuously. Micrometer zero adjustment allows calibration of the integrator — it is accessible by opening door of case.

Three transmitting units are available for use with recorder. None of them employ mercury.

(Electronic Flowmeter is manufactured by The

PALMER
MERCURY ACTUATED

DIAL THERMOMETERS

in 3 types to suit any requirements



Full 4 1/2" dial face. Stem can be placed at any angle and case can be rotated to any readable position.

1 Rigid Stem Dial Thermometer tapered bulb, interchangeable with standard industrial thermometer separable socket. (As illustrated above.)

2 Wall Mounted Dial Thermometer with flexible connecting armor. Case adjustable to easy reading position.

3 Flush Mounted Dial Thermometer for panel mounting with flexible connecting armor.

All three types have a full 4 1/2" dial face.

for accuracy: Mercury actuated... Fully Compensated by Invar Compensation. Guaranteed Accurate 1 scale division.

for angularity: Can be adjusted to most readable position at any angle desired.

for readability: Bold Black Numbers... 11" of scale Reading Dial face can always be placed in easiest readable position.

for interchangeability: Always specify "PALMER" Separable sockets as they are interchangeable for Dial or Industrial type Thermometers.

Send for Bulletin 51-129 for details on the New Palmer Dial Thermometer.

PALMER
THERMOMETERS, INC.

Norwood Ave., Cincinnati 12, Ohio
Mfrs. of Industrial Laboratory
Recording and Dial Thermometers

When inquiring check CP 5770 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Hays Corp., Dept. CP, Michigan City, Ind. . . . or for more information reader may simply check CP 5771 on handy Reader Service slip located between pages 2 and 3.)

**Operating on rate of rise,
controller holds down
on overshoot . . .**

electrical unit designed for heating rates between 10 and 100°F per minute

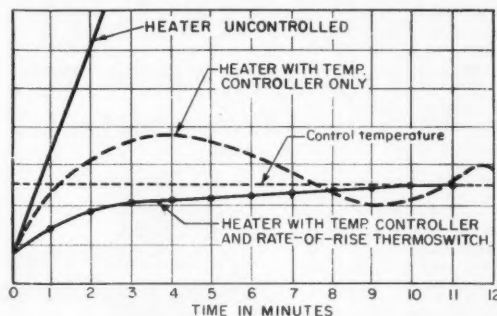
Uses: Rate of rise thermostat is designed to control rate of heating in fast warm-up systems.

Features: Thermostat may be used with standard temperature controls or as separate safety control. System may be brought up to temperature from a "cold" start at rates from 10 to 100°F per minute without temperature overshoot.



Description: Thermostat was designed to prevent oscillation or hunting. It is adjustable for heating rates between 10 and 100°F per minute. When heating rate exceeds preset limit, switch contacts open and interrupt heating cycle temporarily. When rate has returned to a safe level, contacts again close and heating cycle resumes. Ambient temperature limits on

operation are -100 to 550°F. Hermetically sealed, unit is protected against dust, grease, water, or vapors. It also is capable of withstanding shock and vibration.

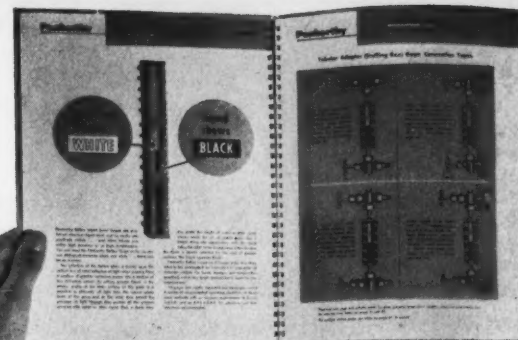


Comparison of warm-up period with and without rate of rise control — note elimination of overshoot and hunting with rate of rise control

Outer shell and exterior electrical terminals are made of stainless steel. Triangular mounting flange is positioned so that cartridge extends 3-3/4 inches below it. Over-all length of unit is 4-3/4 inches. Thermostat weighs about 4 ounces, is 5/8-inch in diameter. Electrical rating is 5 amp at 115 volts AC, or 2 amp at 28 volts DC.

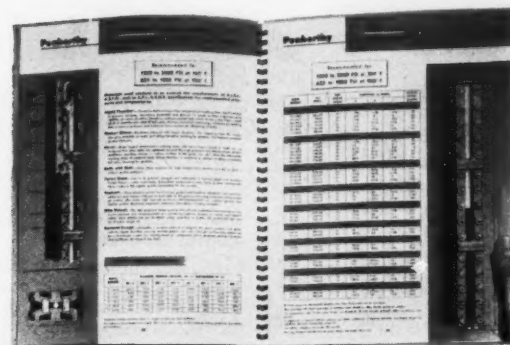
(Rate of Rise Thermostat is a development of Fenwal, Inc., Dept. CP, Ashland, Mass. . . . or for more information check CP 5772 on handy form, pages 2 and 3.)

FACTS AT YOUR FINGERTIPS



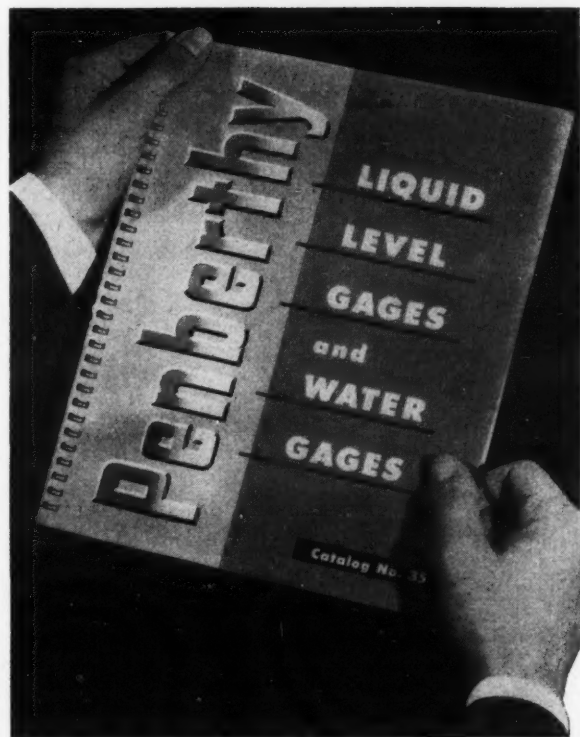
● The advantages of Reflex Liquid Level Gages. The right type and size gage with suitable valves for pressure, temperature, visibility range and valve centers. Multiple section gages. Drop Forged bodies. Pyrex glass. Basic and special designs.

● When to use Transparent Liquid Level Gage Sets. High pressure steam service. Adapters, valves, connections. Types available with recommendations.



● A selection of Liquid Level Gage valves. Specifications. "Floating Shank." Connections and special features.

● Metallurgical specifications. Gage glass and guard rods. Engineering service.



Penberthy's Catalog 35 is jam-packed with illustrated facts and specifications. It is your best guide to selecting the right liquid level gage sets at the most economical cost. In the complete Penberthy line, there are standard products for almost every application. Where your needs are special or unique, use the experience of almost 70 years to solve them. Take a tip from many thousands of satisfied users and write for your copy of Catalog 35.

Established 1886

PENBERTHY INJECTOR COMPANY

Division of the Buffalo-Eclipse Corporation

1242 Holden Ave., Detroit 2, Michigan

**There's Certain satisfaction in products
by PENBERTHY**

When inquiring check CP 5773 on handy form, pgs. 2-3

tools that

Streamline electrical maintenance

FOR ELECTRONIC TROUBLE SHOOTING...



WESTON INDUSTRIAL CIRCUIT TESTER
(Model 785) the versatile 28 range super-sensitive portable tester.

Especially designed for checking electronic control and power equipment. Seven d-c voltage ranges: .1 to 1000 (20,000 ohms per volt) ... six a-c voltage ranges: 5 to 750 (1000 ohms per volt) ... six d-c current ranges: 50 microamperes to 10 amperes ... four a-c current ranges: .5 to 10 amperes ... five resistance ranges: 3000 ohms to 30 megohms ... all ranges full scale ... a-c and d-c current ranges extended with external transformer or shunts.



FOR MOTORIZED EQUIPMENT...



WESTON CLAMP VOLT-AMMETER
(Model 633) measures current and voltage without breaking circuits.

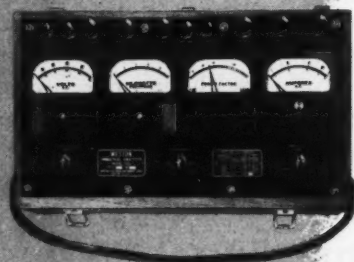
Combines in one instrument five full-scale a-c current ranges of 1000/250/-100/25/10 amperes with range overlap for good readability ... three self-contained a-c voltage ranges of 700/350/-175 volts, with instrument insulated for 750 volt service. Has convenient 6-position thumb switch for range selection, and adjustable pointer stop for measuring motor starting current.



FOR POWER PROBLEMS...



WESTON A-C INDUSTRIAL ANALYZER
(Model 639) a combined Voltmeter, Wattmeter, Power Factor Meter, Ammeter ... all interconnections made! A real timesaver because only one hook-up is necessary to measure a-c current, voltage and power in single and polyphase circuits, as well as power factor in 3 phase, 3 wire, balanced circuits. Adequately insulated binding posts ... high overload capacity. In compact oak case measuring only 18 7/8" x 10 7/8" x 6 7/8".



AVAILABLE THROUGH LEADING DISTRIBUTORS

WESTON Instruments

WESTON Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N. J. 4815

When inquiring check CP 5774 on handy form, pgs. 2-3

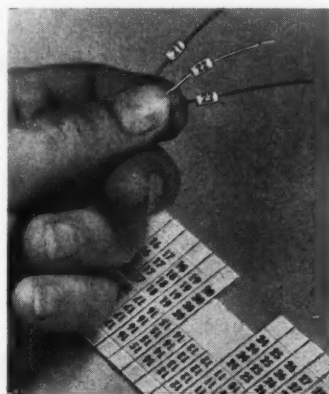
INSTRUMENTATION

Midget markers for wires...

light pressure sticks numbered tabs to wire

Pressure-sensitive coated tabs are designed for small gage wires on electrical and electronic equipment. They are originally designed to save time consumed in trimming larger markers to size. Three-quarters of an inch long, markers are center die cut and mounted on pocket-size backing card two inches wide.

Arrangement of tabs on the card makes it possible to remove any one without disturbing remaining



Sixty-eight individual codes contained on card

codes. Sixty-eight individual markers are contained on card. Tabs are made of tough fabric which resists dirt, moisture and grime.

These tabs are currently available in more than one thousand codes.

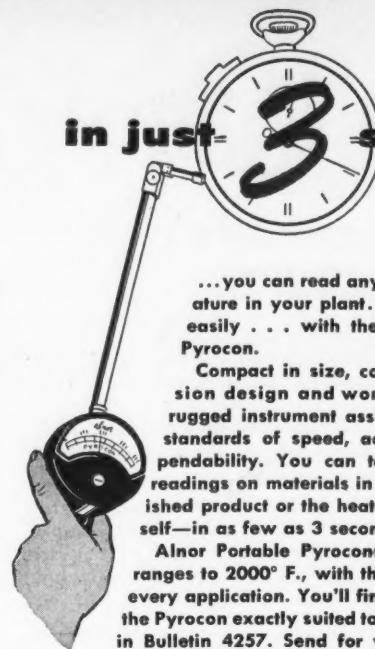
(E-Z Codes are available from Westline Products Div., Western Lithograph Co., Dept. CP, 600 E. Second St., Los Angeles 54, Calif. ... or for more information check CP 5775, pages 2 and 3.)

Shows high-speed DC recorder

In its 8 pages, 2-color bulletin explains high speed direct writing oscillograph.

"Dynograph Recorder" is issued by Offner Electronics Inc., Dept. CP, 5320 N. Kedzie Ave., Chicago 25, Ill. When inquiring specify CP 5776 on handy form, pages 2 and 3.

in just **3** seconds



...you can read any surface temperature in your plant...accurately and easily...with the Alnor Portable Pyrocon.

Compact in size, complete in precision design and workmanship, this rugged instrument assures the highest standards of speed, accuracy and dependability. You can take temperature readings on materials in process, the finished product or the heated equipment itself—in as few as 3 seconds!

Alnor Portable Pyrocons come in scale ranges to 2000° F., with thermocouples for every application. You'll find full details on the Pyrocon exactly suited to your operations in Bulletin 4257. Send for your copy now. Write: Illinois Testing Laboratories, Inc., Room 504, 420 N. LaSalle St., Chicago 10, Ill.

Alnor

PRECISION INSTRUMENTS
FOR EVERY INDUSTRY

When inquiring check CP 5777 on handy form, pgs. 2-3

SHORT RANGE SPANS, HIGHLY SENSITIVE The Taylor TRANSAIRE* Pressure Transmitter!

Designed to measure and transmit pressure changes up to 1,000 ft., it is accurate to 1/2% of the selected short range span and sensitive to pressure changes of 1/2" water.

- Short range spans available 20 to 40 psi, throughout range limit of 35 to 415 psia, and 50 to 100 psi, throughout 100 to 1,000 psia.

- Suppressed ranges throughout pressure limits.

- Volumetric type pressure system is extremely accurate, practically clog-proof, has corrosion resistant 316 stainless steel diaphragm.

- Temperature and barometric compensation for higher accuracy of measurement and control.

Ask your Taylor Field Engineer, or write for Bulletin 98097. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.

*Reg. U. S. Pat. Off.

TAYLOR INSTRUMENTS MEAN ACCURACY FIRST

When inquiring check CP 5778 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Analyzer reads per cent hydrogen directly, continuously . . .

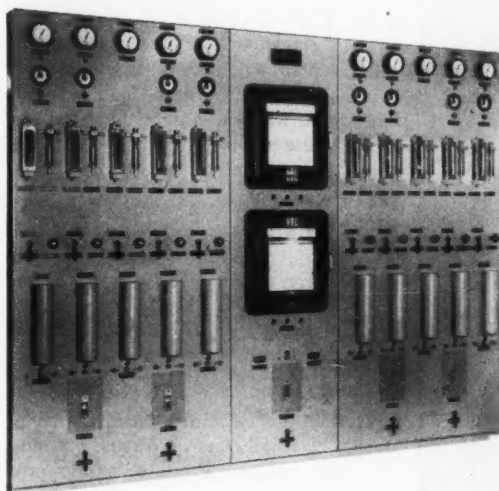
gets accurate results even in the presence of hydrocarbon gases

Uses: Continuous analyzer detects and measures hydrogen in air or hydrocarbon gases in the concentration range from parts per 10,000 up to 100%.

Features: Analysis is based on catalytic oxidation of the hydrogen only. Heat of combustion is measured and recorded directly as concentration of hydrogen in the original sample.

Description: Sample is drawn through analyzer by vacuum pump or, where sufficient pressure is available, by its own pressure. Filters remove dust before flowing gas stream is metered and passed through automatically-controlled valve. Sample is then mixed with diluent air of controlled air rate.

This mixture passes through another filter which maintains constant hydrocarbon concentration and then is passed through the analyzer block. In



Entire hydrogen analyzer is mounted on panel 6' 4" high

analyzer, sample is heated to proper reaction temperature and reaction proceeds in a catalytic bed. Increase in temperature due to reaction is accurately measured by sensitive thermopile. Electrical output of this thermopile is recorded on potentiometric recorder which in turn may be used to control hydrogen concentration in the process stream.

Calibration of instrument is performed by connecting to a tank containing a known concentration of hydrogen. Convenient dial on recorder is used then to set pen in accordance with known concentration.

(Continuous hydrogen analyzer has been developed by Taller & Cooper, Inc., Dept. CP, 75 Front St., Brooklyn 1, N. Y. . . or for more information check CP 5779 on handy form, pages 2 and 3.)

AVAILABLE— A COMPLETELY NEW CONCEPT IN CONTROL VALVE DESIGN...

BODY RATING TO
50,000 PSI
FLOW RANGEABILITY
C_v .000001 TO 0.1

And now — Annin's "Wee Willie" — new in concept and design, providing the Research and Development engineer with a pilot plant instrument having a water C_v range from .000001 to 0.1 with control of pressures to 50,000 PSI. Unique design minimizes distortion, stretching, and freedom. The time-proven Series "A" Domotor power unit provides precise and positive control under all conditions. "Wee Willie" may be the answer to your problems in the high pressure field. Investigate this new valve today!



**"Wee Willie"
DOMOTOR
VALVES**

- 1 Substantial forged alloy (wide selection) valve body.
- 2 Rugged all stainless steel, easily removable, Flo-Mil valve seat.
- 3 Direct positive seal, inlet tubing to valve seat connection.
- 4 Hard chrome-plated, super finished valve stem with stainless steel plug.
- 5 Annin "Super VQ" stem seal assembly.
- 6 Thumbset valve stem locking unit.
- 7 Powerful, lifetime lubricated, cross head, air drive rod assembly.
- 8 Simplified combination stroke and valve anti-adjusting unit.
- 9 Direct and reverse action stem stroke adjusting scale.
- 10 Needle bearing mounting motion converter arm.
- 11 Cross head pre-loading spring, eliminating lost motion.
- 12 Exclusive, extra strong box type frame unit.

Write today for bulletin No. 50WW
for complete information and engineering
data on "Wee Willie"

ANNIN
Control VALVES

THE ANNIN COMPANY

6570 E. THORNTON ROAD, DEPT. A 22
LOS ANGELES 22, CALIFORNIA

When inquiring check CP 5780 on handy form, pgs. 2-3

EMSCO

**THE NAME TO LOOK FOR
ON A SWIVEL FITTING**



free turning

...HERE'S WHY!



There is no secret to the superior free turning qualities of an EMSCO Ball Bearing Swivel Fitting. Recognized engineering practice of loading ball bearings so that the thrust load is through the bearings at their maximum diameter is employed.

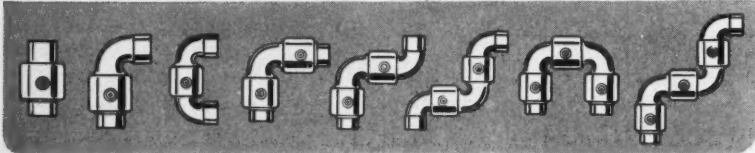
The races on which the double rows of balls rotate, through a full 360 degrees, are perpendicular to the main line of force. These features combined assure easy turning under great pressure or physical loading.

Adjusting for bearing wear is so simplified it may be accomplished while fitting is in service. A wide selection of packing for various types of service is available. Repacking without breaking end-connections is an outstanding EMSCO feature. Result: long service life; no discarded fittings; no expensive return to factory for repair.

EMSCO Swivel Fittings are manufactured for practically every type of service; from high vacuum to pressures of 15,000 psi., and from sub-zero temperatures to 750°F. Simply tell us your application and type of end connections required. Complete information, prices and delivery upon request.

EMSCO MANUFACTURING COMPANY

BOX 2098, TERMINAL ANNEX
Houston, Texas LOS ANGELES 54, CALIF. Garland, Texas



When inquiring check CP 5781 on handy form, pgs. 2-3

INSTRUMENTATION & CONTROL

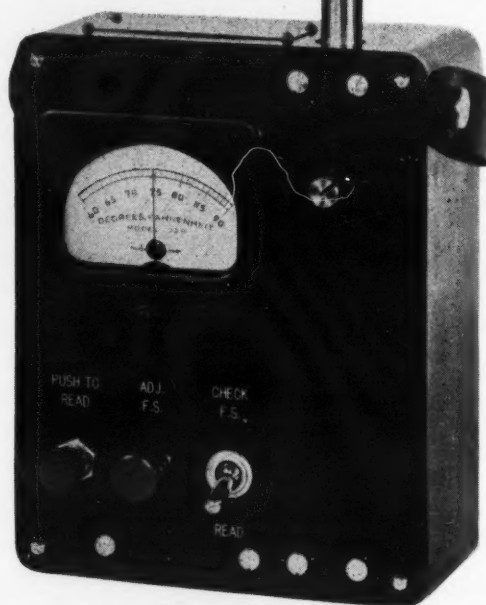
**Takes temperature
in 2 seconds...**

thermistor is key to fast response of indicator

Uses: While it can be used as a general purpose thermometer, fast response time makes this instrument especially valuable in checking transient temperatures in start-up, making heat balances, etc.

Features: Responds to temperature changes in 2 seconds or less.

Description: Thermistor sensing element of the instrument is contained in a retractable prod. As shown in illustration, prod extends about 4 inches above top of instrument. When retracted, prod and thermistor are entirely housed within case. Temperature readings appear on a 2-inch dial. Usual tem-



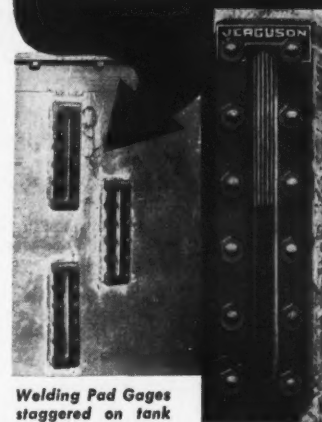
Fully portable, it has a scale span of 30°F

perature range is 60 to 90°F (original model was used for fast checks of heating equipment). But other ranges with approximately 30°F spread can be furnished. Temperature limits of range are -20 to 220°F.

Two standard flashlight cells are used for power. These are enclosed in case itself. Circuit is on the bridge type with thermistor making up one leg. Accuracy is 3% of full scale. Current drain is low — batteries have a minimum life of 6 months.

Measuring 4 x 5 x 1½ inches (prod retracted), indicator weighs 2½ pounds. Delivery depends on scale required, runs from immediate to 45 days.

**SPECIAL
JERGUSON
WELDING PAD GAGES
are integral part
of this tank**



Welding Pad Gages staggered on tank for continuous visibility.

HERE is a special line of gages that weld right to the liquid containing structure, thus becoming an integral part of it. It solves problems where it is impractical for you to use a conventional type gage because of solids in suspension in a liquid, etc.

These Special Gages follow Jerguson Standard Gages in general design and materials, except for the method of attaching. The chamber of the gage consists of a bar steel pad which is welded to the vessel.

Welding Pad Gages are made in both Reflex and Transparent types... in all sizes of Jerguson Standard Gages. Pressure ratings are available to your specific requirements. Welding pad may be of any metal desired to withstand corrosive or other conditions.

Write for Data Unit on Welding Pad Gages for complete details. Whatever your gage problems, let Jerguson engineers assist you.

JERGUSON
Gages and Valves for the
Observation of Liquids and Levels
JERGUSON GAGE & VALVE COMPANY
100 Fellsway, Somerville 45, Mass.
Offices in Major Cities
Jerguson Tress Gage & Valve Co., Ltd., London, Eng.
Pétrole Service, Paris, France

When inquiring check CP 5782 on handy form, pgs. 2-3

CHEMICAL PROCESSING

("Fastherm" Temperature Indicator is a development of Associated Research, Inc., Dept. CP, 3758 W. Belmont Ave., Chicago 18, Ill. . . . or for more information check CP 5783 on handy form, pages 2 and 3.)

Bridge circuit with magnet measures oxygen content of gases . . .

accuracy of 0.15% oxygen attained in 0 to 10% range

Uses: For accurate measurement of oxygen content in range from zero to 10%.

Features: Instrument uses paramagnetic property of oxygen in combination with an electronic bridge circuit for fast measurement.

Description: Three basic parts of instrument are recorder, analyzer, and sample conditioner. Sample conditioner supplies a pressure-compensated, filtered and regulated flow of gas and reference air samples at constant saturation.

Aspirator is air-operated, requires 2 cfm and a water supply of 0.15 gph. Analyzer contains cell block with two reference and two measuring cells together with magnet assembly and bridge circuit. These are all enclosed in thermally-controlled insulated case designed for flush panel mounting. Recorder takes signal from analyzer and employs double

bridge design. Record is a continuous line in range from 0 to 10% oxygen in flue gas or in nitrogen as specified. Both ground chart and strip chart recorders may be employed.

Overall performance characteristics allow for accuracy of $\pm 0.15\%$ oxygen when calibrated against standard gas mixtures. This accuracy can be adjusted by recorder dial rheostats to any plant standard. Sensitivity is better than $\pm 0.05\%$ oxygen and stability is better than $\pm 0.15\%$ oxygen. Speed of response is reasonably fast — 8 to 12 seconds for initial response, with 90% of final reading obtained in 35 seconds.

Unit requires 350 volt amperes at 150 volts 60 cy. (Oxygen analyzer and recorder is manufactured by Leeds & Northrup Co., Dept. CP, 4934 Stenton Ave., Philadelphia 44, Pa. . . . or for more information specify CP 5784 on handy Reader Service slip located between pages 2 and 3.)

Unit requires 350 volt amperes at 150 volts 60 cy. (Oxygen analyzer and recorder is manufactured by Leeds & Northrup Co., Dept. CP, 4934 Stenton Ave., Philadelphia 44, Pa. . . . or for more information specify CP 5784 on handy Reader Service slip located between pages 2 and 3.)



Operates on paramagnetic property of oxygen

LESLIE Floatless Level Control takes the PRIMA DONNAS out of liquid level control



Hydraulic force acts directly on diaphragm-stem assembly and changes air pressure to control valve. Air pressure and valve travel are directly proportional to level change.

Here is level control that is not affected by surface agitation, equipment vibration, or the roll of a ship—a simple design that provides steady, positive, precise control even under extreme conditions.

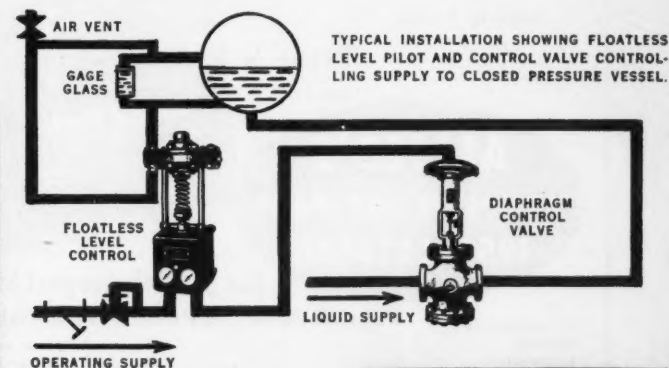
Thousands are in service today, providing accurate control of liquid level (plus or minus 1" water column) and eliminating the problems caused by troublesome linkages, torque tubes, floats and stuffing boxes.

Note these special features—

1. Can be installed anywhere below liquid level . . . on control panel, if desired.
2. Simple, compact, one adjustment unit . . . weighs only 40 lbs.
3. Diaphragm stem assembly is only moving part. Diaphragm element doesn't require recalibration during service.

When specifying . . .

Here's another LESLIE standard item to fit specifications that are special orders with most manufacturers. When specifying pressure, temperature or level controls—for new or replacement service—it will pay to check first with your nearest LESLIE engineer. He's listed in the classified telephone directory in principal cities . . . under "Regulators" or "Valves"



SEND FOR DESCRIPTIVE DATA PC-37

LESLIE

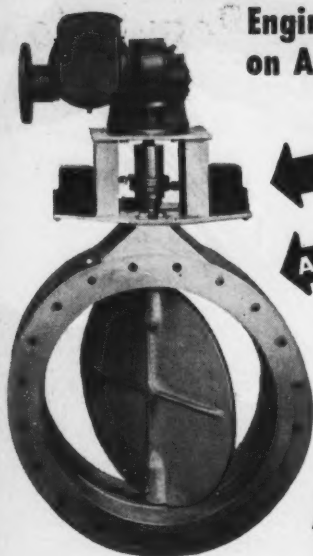
TOPS IN QUALITY PRESSURE LEVEL AND TEMPERATURE CONTROLS Since 1900

LESLIE CO., 281 Grant Avenue, Lyndhurst, New Jersey

When inquiring check CP 5785 on handy form, pgs. 2-3

W. S. ROCKWELL VALVES

Engineered for Dependable Service
on Air, Gases, Liquids, Semi-Solids



FULL FLOW

with minimum pressure drop.

ANY CONDITIONS

of commercial, drip-
or bubble-tight closure,
with quick, positive control and
shut-off manually or automatically.

RESISTANT

Made ruggedly
for all conditions of
corrosion, erosion, temperatures
to 2000° F., pressures to 300 p.s.i.

ALL TYPES

Butterfly, wafer or slide
valves, 1" to 120" pipe size.



W. S. ROCKWELL COMPANY

BUTTERFLY VALVES • SLIDE VALVES • AUTOMATIC VALVES

2204 ELIOT STREET • FAIRFIELD, CONN.

Sales Representatives in Principal Cities

When inquiring check CP 5786 on handy form, pgs. 2-3

the most widely
used Electronic
Supply Guide

free

send for it

ALLIED'S
COMPLETE 268-PAGE
1954 CATALOG



the World's Largest Stocks of

ELECTRONIC SUPPLIES FOR INDUSTRY

We specialize in
Electronic
Equipment
for Research,
Development,
Maintenance
and Production
Operations

COMPLETE EXPERT
Industrial Service

One complete
dependable source
for everything
in electronics

Simplify the purchasing of all your electronic supplies and equipment. Send your orders to us at ALLIED—the reliable one-supply-source for all your electronic needs. Depend on us for quick shipment from the world's largest stocks of special-purpose electron tubes, test instruments, audio equipment, electronic parts (transformers, capacitors, controls, etc.) and accessories—everything for industrial and communications application. We make immediate shipment from complete quality lines that are always in stock. Send today for your FREE copy of the 1954 ALLIED Catalog—the complete up-to-date guide to the world's largest stocks of Electronic Supplies for Industrial and Broadcast use.

ALLIED RADIO CORP.

100 N. Western Ave., Dept. 72-A-4
Chicago 80, Illinois

SEND FOR
FREE
CATALOG

When inquiring check CP 5787 on handy form, pgs. 2-3

INSTRUMENTATION

Optical research service
shows practical results
on products . . .

waxed paper, paints among
materials studied

Research on optical qualities of chemical products is "part physics, part psychology, and part engineering." This is the opinion reached by a laboratory rendering such service to its clients. This laboratory service has been built around the idea that electronic devices are capable of detecting many optical qualities which the human eye cannot. Advanced instrumentation also makes it possible to apply numbered grading scales to qualities not otherwise easily measurable.

As examples of work which they have done, there are cases like these: porcelain enamel manufacturer was checking color specifications of his bathtubs with a spectrophotometer. Research was able to show that by changing phototubes and changing to ceramic standards, better accuracy and speed were obtainable. In another case, a simplified fast method for testing transparency of waxed paper was devised.

Research service is set up to test light sources and apertures, materials which are opaque (non-metallic and metallic), translucent, and transparent. Typical example of the materials and objects they work with are television picture tubes, paints, textiles, papers, plastics, ceramics.

(Work is being done by Hunter Associates Laboratory, Dept. CP, 5421 Brier Ridge Road, Falls Church, Virginia . . . or check CP 5788, pages 2 and 3.)

**Wide limits of temp,
pressure possible
with switch . . .**

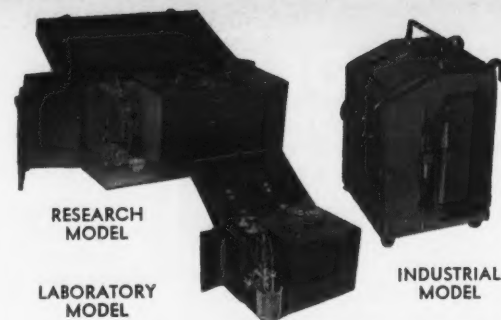
actuated by 10 to 200 psi

Uses: Electrical switch can be thrown at pre-determined pressure between 10 to 200 psi.

Features: Very simple construction is used in this unit.

Description: Pressure switch is 2½ inches in diameter. It can

(Continued on page 68.)



RESEARCH
MODEL

LABORATORY
MODEL

INDUSTRIAL
MODEL

Cambridge pH Meters

The three portable models illustrated above incorporate new and important advantages. A.C. line operation eliminates battery nuisance. Laboratory and Research models use electron-ray tube for precise null-point indication. Industrial model is direct-reading, continuous-indicating; ruggedly built for plant use.

Accuracy: Research .02 pH, Laboratory .05 pH, Industrial .10 pH. Cambridge pH equipment also includes single- and multi-point indicators and recorders. Send for Bulletin 910-M.

CAMBRIDGE INSTRUMENT COMPANY, INC.
3706 GRAND CENTRAL TERMINAL, NEW YORK 17, N. Y.

**Pioneer Manufacturers of
PRECISION INSTRUMENTS**

When inquiring check CP 5789 on handy form, pgs. 2-3

Wallace & Tiernan
MASSOMETER

**FOR METERING
FREE FLOWING
SOLID MATERIALS**

Pneumatic
Recording
•
Maximum
Capacity
225 lb. per min.
•
Accuracy ± 1%
•
Overall Height—24½ in.

M-28 Write today for Description

WALLACE & TIERNAN
COMPANY INC.
25 MAIN STREET, BELLEVILLE 9, N. J.

When inquiring check CP 5790 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Keeps corrosive gases out of lines . . .

thermocouple tube is made of stainless, sealed with graphite, Neoprene, or Teflon

Uses: Small diameter thermocouple tube is designed for 20 or 24 gage insulated duplex thermocouple.

Features: Smallness of well provides fast response, yet seal design prevents corrosive gases from "breathing" into instrument lines.

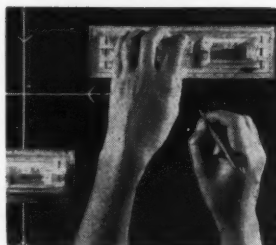
Description: Thermocouple well is designed to eliminate junction boxes and provide fast interchangeability of thermocouples. Small diameter of tube and subsequent low mass helps in holding down response time. Entire tube is made of stainless steel to resist corrosion. Usual models are sealed with Neoprene. Teflon or asbestos graphite are also available for sealing.

In place of usual junction box, adjustable tube fitting is provided for sealing and adjusting immersion of thermocouple protection tube in vessel. Type 304 stainless is material of construction throughout. Tube is 3/16-inch in diameter (wall thickness 0.035 inches). Fittings are 1/2 inch hex and are 1 1/16 inch long.

("Speedwell" protection tube is manufactured by Conax Corp., Dept. CP, 4515 Main St., Buffalo 21, N. Y. . . or for more information reader may simply check CP 5791 on handy form, located between pages 2 and 3.)

Takes place of T-square and triangle . . .

transparent drawing instrument rolls horizontally or vertically



Uses: Versatile pocket instrument for drawing combines functions of triangles, T-squares, straight edges, scales, protractors, and parallel rules.

Features: Instrument will roll in vertical or horizontal direction—small thumb button

permits user to change direction of travel easily.

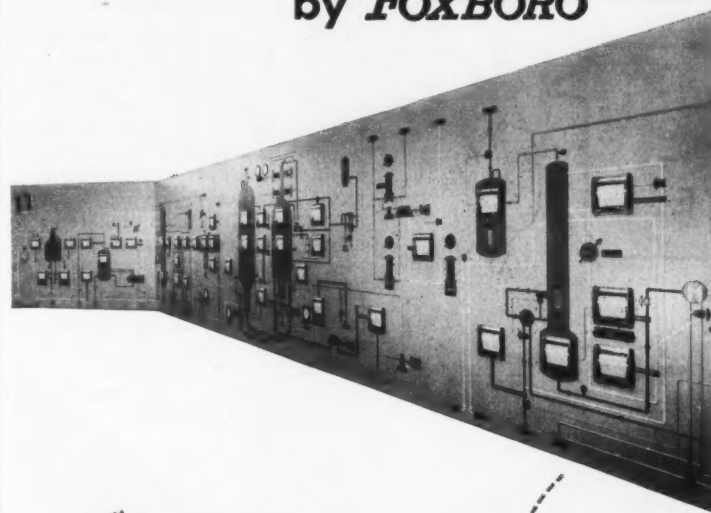
Description: Handy-to-carry transparent drawing instrument measures 2 1/2 x 9 inches. Accurately engraved scales (in 16ths and 20ths of an inch) and protractor with a full 180° of angles are carried on instrument body.

(Glide-Rule is a development of Smith Drake Corp., Dept. CP, 1206 S. La Brea Ave., Inglewood, Calif. . . or for more information reader may simply check CP 5792 on handy form, located between pages 2 and 3.)

Follow the Leaders . . . specify

GRAPHIC PANELS

by **FOXBORO**



COMBINATION UNIT CONTROL PANEL for a Standard Oil Company (New Jersey) Affiliate. The panel makes full use of compact, full-visibility Foxboro Consotrol Recorders and Recording Control Stations located in the process diagram for easy operation and trend analysis.



Here and abroad, leading manufacturers are saving time and money by utilizing Foxboro's expert panel engineering facilities to provide them with Graphic Panels of outstanding efficiency and appearance.

Specialists in the field, Foxboro will engineer and fabricate a Graphic Panel exactly to your specifications—or will design one directly from your flow sheet. And they will recommend the most practical instrumentation and arrangement.

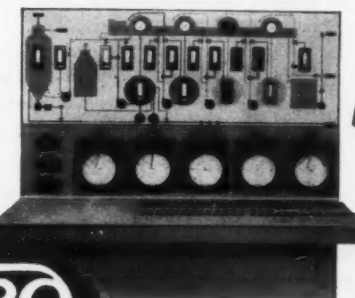
The Graphic Panels shown here are typical of the many now in operation throughout the world.

Write for detailed information on Foxboro Graphic Panels; also Bulletin 471 on Consotrol Instrumentation.

The Foxboro Company
811 Neponset Ave., Foxboro, Mass.



ALKYLATION UNIT CONTROL PANEL for Standard Oil Company of Ohio. Uses both Consotrol and standard size instruments. All critical controls are within immediate reach . . . all operating adjustments conveniently accessible from front of panel.



GRAPHIC PANEL for Gaylord Container Corp. controls four-stage vacuum pulp wash, indicating type control instruments are located in the process diagram. Operation records appear on pneumatic 6-point Circular Chart Recorders located below related instruments in diagram. Normal and emergency operating controls and signal lights are neatly arranged on panel desk for easy identification.

FOXBORO

Reg. U. S. Pat. Off.

PROCESSES AND INSTRUMENTATION

When inquiring check CP 5793 on handy form, pgs. 2-3



DOES THERMO ELECTRIC
MAKE WIRE TYPE
THERMOCOUPLES?

CERTAINLY. TRY AND
NAME A THERMOCOUPLE
T-E DOESN'T MAKE.



WIRE TYPE, PROTECTED THERMOCOUPLE

In Iron Constantan, Copper Constantan, or Chromel Alumel; mirror-polished protection tube resists chemical corrosion; for temperatures from as low as -300°F up to 2400°F, depending on calibration.

The wire type is one of many, standard, T-E thermocouples for taking process temperatures. Other kinds include tubular, bayonet immersion contact, exposed loop, and shielded.

Each careful step in their production, from calibrating to final testing, is handled in T-E's own plant. Our production facilities, combined with the skill and experience of our engineers, are at your service to develop special 'couples for unusual applications.

Furthermore, at T-E you can choose from a large selection of protection tubes — built-up or bar stock — in stainless steels and a wide range of other materials. Will we make special tubes? Of course.

Interested? Want the name of the T-E rep nearest you? Let us know, on your letterhead. Want more data? Ask for Catalog 22-R.

Pyrometers • Thermocouples • Protection Tubes • Quick-Coupling Connectors
Thermocouple and Extension Wires • Resistance Bulbs • Connector Panels

Thermo Electric Co., Inc.

SADDLE RIVER TOWNSHIP, ROCHELLE PARK POST OFFICE, NEW JERSEY
IN CANADA—THERMO ELECTRIC (Canada) Ltd., BRAMPTON, ONTARIO

When inquiring check CP 5794 on handy form, pgs. 2-3

INSTRUMENTATION

(Continued from page 66)

be used in applications including control or warning systems. Unit is designed to be safe for high overpressures and is also suitable for use with hydrocarbon oils.

Switch can be quickly disconnected. It will operate within a temperature range of -60 to over 160°F. Operation is stable despite vibrations of about 1/16th inch in the frequency range from 10 to 55 cycles per second. Switch section handles 5 amp at 125 or 250 v AC. It is also capable of handling 3 amp inductive motor loads at 30 v DC.

(Mod 44517 Pressure Switch is manufactured by G. M. Giannini & Co., Inc., Dept. CP, 117 E. Colorado St., P.O. Box N, Pasadena 1, Calif. . . . or check CP 5795, pgs. 2 and 3.)

Low-voltage relay stands shaking, acceleration . . .

it handles 2 amp at 26 volts,
is just over 1 3/4" high

Uses: Miniature relay is designed for control circuits employing DC of about 26.5 volts.

Features: Relay is designed to operate under 70 gravities acceleration and will stand continuous vibration from 10 to 600 cycles without mechanical resonance.

Description: Hermetically sealed relay has double-pole double-throw action. Positive in action, relay will operate throughout range from -65 to 125°C.

Life expectancy, based on contacts operating under rated load at 12 cycles per minute, shows that 100,000 cycles can be completed. Contact bounce of unit is extremely short (250 microseconds) and contact rating is 2 amps with a 26.5 volt DC resistance load. Required input coil power is less than 0.325 watts. Any coil resistance up to 25,000 ohms may be supplied. Dimensions are 1.79" x 1.188".

(Type DC-33 Control Relay has been developed by Deltronic Corp., Dept. CP, 9010 Bellanca Ave., Los Angeles 45, Calif. . . . or for more information check CP 5796, pgs. 2 and 3.)



Cut Cost
of METAL
FINISHING

With

POWERS

NEW

Temperature REGULATOR

For Plating, Anodizing, Bonderizing, Pickling, Cleaning, Rinsing, and Chromate Dips. Powers No. 11-MF Regulators will help you get the most effective use from various solutions by holding them at the right temperature automatically.

Plastic Covered Thermal Bulb and Tubing—is highly resistant to solutions in above processes. Prevents electrical shorts. No insulators required for the regulator.

Easy to Read 4" Dial Thermometer—indicates temperature of liquid being controlled and makes it easy to adjust regulator for different temperatures. (b51)

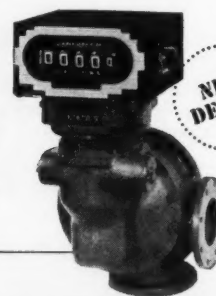
Bulletin 330 describes this simple, dependable control.

THE POWERS REGULATOR CO., SKOKIE, ILL.
Offices in over 50 Cities, see your Phone Book • Established in 1891

When inquiring check CP 5797 on handy form, pgs. 2-3

NOW you
can have
**METERED
IDENTIFICATION
for**

**formula,
inventory
and cost
controls**



NEW
DESIGN

**STAINLESS STEEL
METER
Inside and Out**

STOPS CORROSION PROBLEMS HANDLING FOODS, PHARMACEUTICALS, CHEMICALS, OTHER LIQUIDS

This new Rockwell Type 2BC Rotocycle meter is of all-stainless steel construction; corrosion-resistant, easy to clean. It provides accurate records of quantities of liquids handled which are so important in quality control, scheduling, cost accounting and tax analyses. Quantity Control Registers and Remote Registration Systems are available. Described in Bulletin OG-403. Write Rockwell Mfg. Co., Dept. A-7, Pittsburgh 8, Pa.

In Canada: Peacock Brothers Limited



You Can RELY ON ROCKWELL

**INDUSTRIAL
METERS**

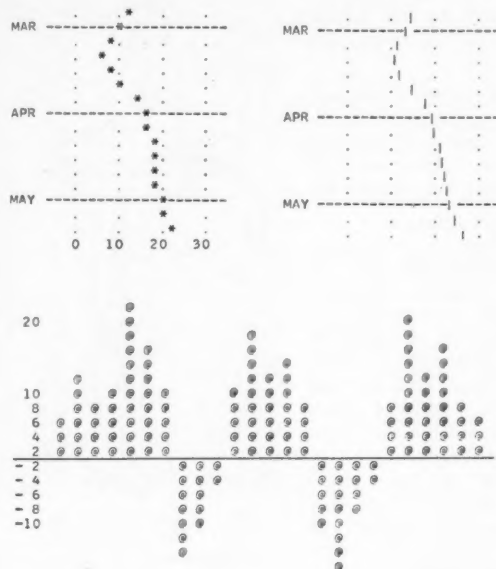
When inquiring check CP 5798 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Existing business machines print graphs, charts . . .

punched card directions make unique records possible

Graphic presentation of performance or values can be made by existing business machines. Line graphs, point graphs, bar graphs, and others are possibilities. Such graphs have been constructed from punched



Typical samples of charts printed on business machines

cards on manufacturer's Type 407 Accounting Machine. Although other business machines are also capable of doing this, 407 seems to have advantages. One hundred line graph points can be printed from machine's 25 type wheels. Under most circumstances spacing in the vertical direction is 6 to the inch.

(Development work of using business machines for printing graphs was done by International Business Machines Corp., Dept. CP, 590 Madison Ave., New York 22, N. Y. . . . or for more information check CP 5799 on handy form, pages 2 and 3.)

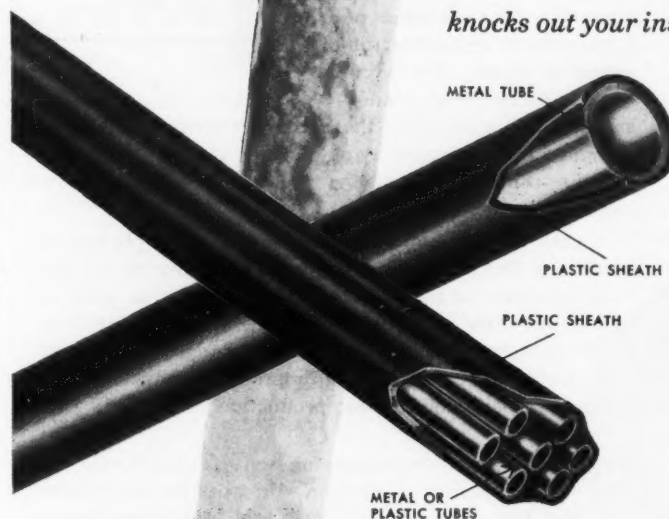
Contains data, graphs on thermocouples

Illustrated catalog-data book is 40 pages long. Several tables and plots show output of various standard thermocouples against temperature. Temperature conversion tables are also included.

Variety of thermocouples, accessories, wells, and temperature instruments are illustrated and specified. Cat TC-10 is issued by Barber-Colman Co., Dept. CP, Rockford, Ill. When inquiring specify CP 5800 on handy form, pages 2 and 3.

DEKORON INSTRUMENT TUBING

knocks out your instrument line corrosion problems



DEKORON single-line tubing. Samuel Moore & Co. will coat your copper, aluminum or steel tubing by the Dekoron extrusion process, or will supply coated tubing. Straight lengths to 20 ft., coils to 1000 ft.

DEKORON IMPERVAPAK is a multiple tube harness of plastic or metal tubes encased in tight plastic sheath. Multiple tube construction cuts down installation costs.

Corrosion endangers the life line of your plant—your instrument tubing. That's why you should investigate Dekoron instrument tubing, the tubing that's impervious to moisture, salt air, corrosive atmospheres, and chemicals.

That means Dekoron eliminates replacement costs and maintenance. Other advantages are low initial cost . . . less plant down time . . . easy installation with standard fittings and plastic tape.

In replacement savings alone—not including lower maintenance and installation costs—Dekoron Instrument Tubing pays for itself over and over again.

A-7834



Send for free copy of Bulletin L-6506
"3 Ways to Whip Corrosion and High
Tubing Installation Costs in Your Plant."

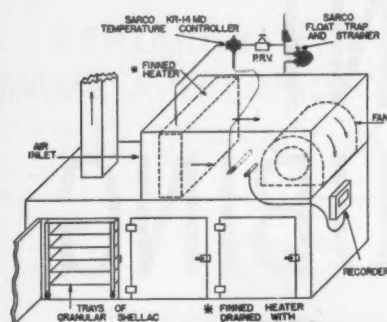
Dekoron[®] tubing



SAMUEL MOORE & COMPANY
DEKORON TUBING DIVISION • MANTUA, OHIO

When inquiring check CP 5801 on handy form, pgs. 2-3

Misused steam plays havoc with production schedules and costs



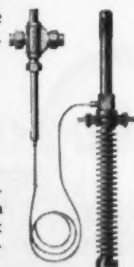
How Capital Shellac Maintains Uniform Drying

Capital Shellac, Bklyn, N. Y., was having difficulty holding even temperature in a shellac dry box. This box is used to remove moisture from granular shellac.

The problem was caused by periodic opening of doors and the inability of the control system to hold temperature constant under these conditions.

Sarco suggested the use of its KR-14-MD Temperature Controller set at 100°F using an extra sensitive bulb and closely balanced double-seated valve.

Mr. F. W. Davidson, Capital Shellac plant manager, reports that nearly constant temperature is now maintained and moisture uniformity accurately controlled.



Sarco Temperature Regulator KR-14-MD

Accurately controls air temperatures — hooked up with steam or brine lines, unit heaters or coolers, or air conditioning systems.

IN YOUR processing operations, are you up against troubles such as slow-ups, uneven or inadequate heating, poor temperature control—resulting in reduced output, lowered product quality and increased costs?

You may suspect that your equipment is at fault. But process heating headaches often are due to ineffective utilization of steam. The wrong type trap can cause condensate to waterlog equipment. Improper air-venting can reduce the rate of heat transfer by as much as 11%. Manual temperature control may prove erratic, affect product quality, increase production costs.

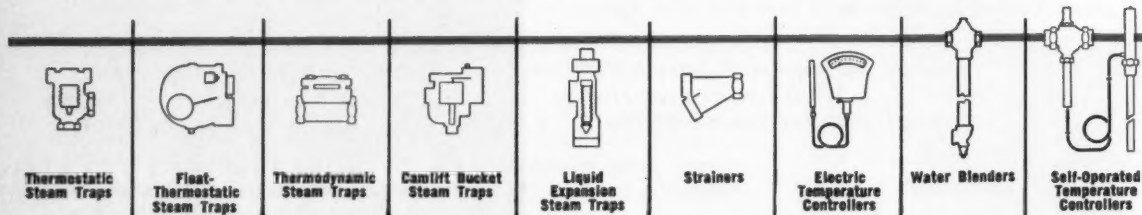
If your plant is suffering from any of these production handicaps, Sarco can help you. Sarco has a wealth of practical experience in the process industries to put to work for you. Plant after plant, with Sarco help, has licked these problems through simple, inexpensive changes. The results have been: increased output, improved product quality uniformly maintained, lower production costs.

Engineering Service: Our engineering service is yours for the asking. Call our local representative, or, write today for case histories describing how other plants in your field have solved similar problems through the proper application of steam traps and inexpensive temperature controls. Sarco Company, Inc., Empire State Bldg., New York 1, N. Y.

SARCO

improves product quality and output

STEAM TRAPS • TEMPERATURE CONTROLLERS • STRAINERS



When inquiring check CP 5802 on handy form, pgs. 2-3

INSTRUMENTATION & CONTROL

Leaks no worry — pump operates submerged . . .

small flows (maximum of 3200 cc/hr) handled at pressures to 100 psi

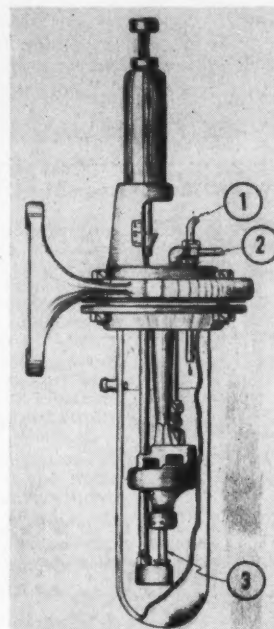
Uses: Miniature-controlled volume pump is designed especially for handling dangerous fluids where capacities do not exceed 3200 milliliters per hour.

Features: Because pumping cylinder is submerged, problems of stuffing box leakage are eliminated.

Description: Pump is immersed in liquid to be pumped. It meters with highly reproducible accuracy, is driven by air or electric motor. Since capacity may be regulated either manually or automatically, unit can be used as a single element or a final control element in systems with instrumentation.

Capacities from 3 to 3200 milliliters per hour are obtainable. Wide construction of materials are available for this pump. Discharge pressures of 1000 psi may be reached with both 1/4 and 1/8" diameter plungers.

(Submerged "miniPump" has been developed by Station F, Milton Roy Co., Dept. CP, 1300 E. Mermaid Lane, Philadelphia 18, Pa. . . . when inquiring check CP 5803 on handy form, pages 2 and 3.)



Fluid is admitted at inlet (1), collected in sump, pumped out by plunger (3) to discharge (2)

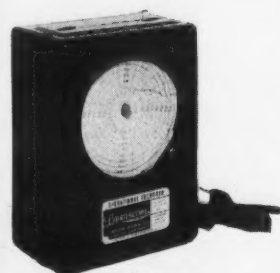
Seven-day recorder charts "on", "off" periods . . .

shows record of operation to nearest 5 min

Uses: Designed for multiple recording of process timing. Though it may be used for a variety of applications, primary function is monitoring of unattended equipment such as pumping stations, appliances, and so forth.

Features: Recorder runs for a period of seven days — it is capable of discriminating to nearest five minutes.

Description: Recorder is electrically driven by synchronous motor. It consists of a metal stylus which traces continuous record on pressure-sensitive



Checks operation at "high," "low," or "normal"

paper chart for a seven-day period. Stylus is capable of noting three positions: middle position indicates normal measurement, second position indicates deviation above normal, third position indicates deviation below normal. Chart paper is attached to disc driven by timing motor. Cam and follower mechanism actuate stylus move-

ment. Positive alignment of stylus to paper chart is assured by locating pin.

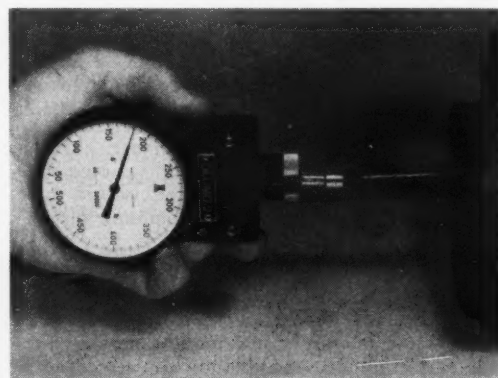
Each 24-hour period is a portion of inward spiral moving continuously from outer edge to center of chart paper. Finished record covers seven-day period and time discriminations to five minutes may be made.

(Operational Recorder is a product of Librascope, Inc., Dept. CP, 1607 Flower St., Glendale, Calif. . . . or for more information check CP 5804 on handy form, pages 2 and 3.)

Checks revolutions from 40 rpm to 50,000

Uses: Portable hand tachometer indicates revolutions per minute of motor or other shafts.

Description: Standard construction is used in tachometer with a range from 40 to 50,000 rpm. Scale reads instantly when rubber tip is pressed



against revolving shaft. Instrument has black crackle finish and is furnished with leatherette case.

(Tachometer is manufactured by Montgomery & Co., Inc., Dept. CP, 53 Park Place, New York 7, N. Y. . . . or for more information check CP 5805 on handy form, pages 2 and 3.)



You're Always on the Safe Side

WHEN YOU SPECIFY

ASHCROFT Maxisafe DURAGAUGES

Here is the gauge that provides absolute protection to the viewer from tube rupture due to any cause.

In this new Ashcroft Maxisafe* Duragauge, an integrally cast solid wall separates the dial from the Bourdon tube and movement. The entire back of the case is covered by a double spring-mounted safety release plate. Teflon coated and tightly fitted on a rubber gasket, the plate is held in place by a knurled knob. If the tube ruptures, pressure less than 1/2 p.s.i. will force the plate open and vent the discharge to the rear.

Always be on the safe side. Get absolute protection against the possibility of tube rupture — specify the Ashcroft Maxisafe Duragauge. The Maxisafe has all *Reg.

NOTE THE SOLID WALL

that separates the dial from the Bourdon Tube and movement. Three 3/4" lugs on the back flange hold the Maxisafe away from the wall and permit the safety plate to release. The case design also provides easy, quick access to the movement and tube assembly for inspection, repair or recalibration.



FOR FAST DELIVERY — buy from your Industrial Distributor. He stocks Manning, Maxwell & Moore products locally — saves you the trouble and expense of maintaining a large inventory in your own plant.



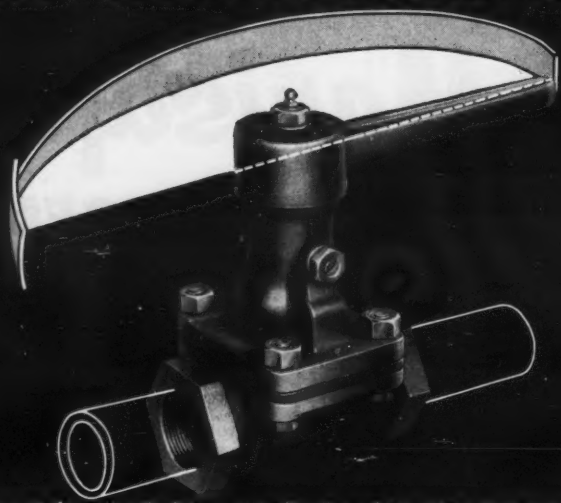
ASHCROFT GAUGES

A product of **MANNING, MAXWELL & MOORE, INC.** STRATFORD, CONNECTICUT
MAKERS OF 'ASHCROFT' GAUGES, 'HANCOCK' VALVES, 'CONSOLIDATED' SAFETY AND RELIEF VALVES, 'AMERICAN' INDUSTRIAL INSTRUMENTS. BUILDERS OF "SHAW-BOX" CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES.

When inquiring check CP 5806 on handy form, pgs. 2-3

with this corrosion resistant valve . . .

**YOU GO FROM FULL OPEN
TO FULL CLOSED IN A
180° SWING OF THE LEVER**



HILLS-McCANNA

Quick Opening

SAUNDERS PATENT DIAPHRAGM VALVES

Where you must combine the ability to handle tough services with quick opening—quick closing characteristics, Hills-McCanna Lever operated Diaphragm Valves are the answer. The lever action is smooth and positive. An adjustment for holding the handle in an intermediate position provides throttling when required. Available with choice of fifteen diaphragm materials including rubber, neoprene, polyethylene, Kel-F and Teflon. Choice of over fifty body materials that include rubber, glass, lead, and plastic linings, any machinable alloy and plastics. Dependent upon materials and size, Hills-McCanna Saunders Patent Valves are suitable for temperatures to 400°F., pressures to 150 psi. Write for descriptive literature. HILLS-McCANNA CO., 2370 W. Nelson St., Chicago 18, Illinois.

HILLS-McCANNA

saunders patent diaphragm valves

**Also Manufacturers of Proportioning Pumps
Force Feed Lubricators • Magnesium Alloy Sand Castings**

When inquiring check CP 5807 on handy form, pgs. 2-3

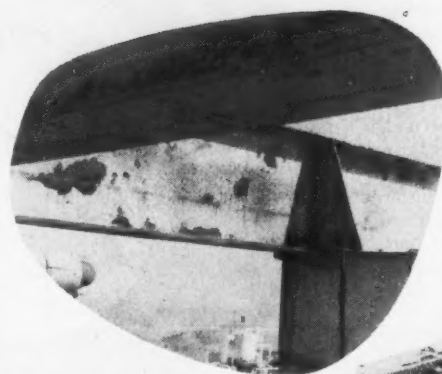
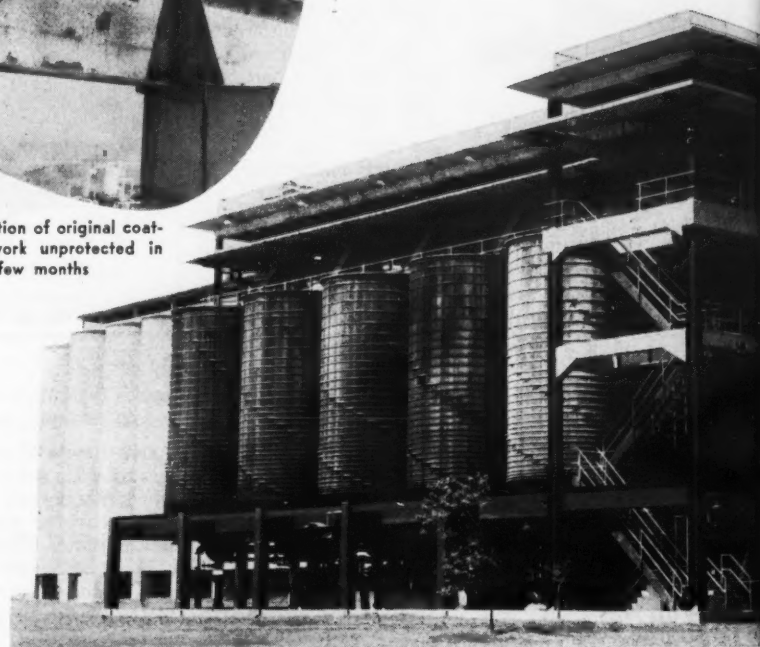


Fig 1—Deterioration of original coating left steel work unprotected in only a few months



Corn Products controls corrosion with asphaltic coating

**Protects Texas Bluebonnet Plant
from effects of highly corrosive,
moist salt air, while providing
excellent insulation when
impregnated with cork**

Problem: The Bluebonnet Plant of Corn Products Refining Co. is located just outside of Corpus Christi, Texas on Nueces Bay near the Gulf of Mexico. Year around high humidity and temperature conditions, combined with salt air make the natural atmosphere extremely corrosive. Rapid temperature changes plus evaporation from the shallow bay tend to increase the salt content of the air even

more than it would be otherwise. In addition, the plant is subjected to some SO₂ gases, as well as to chlorine, caustic, and other chemicals from surrounding plants.

Steel framework and equipment in the plant were originally coated with conventional paints, which lasted only a short time. In some cases, coatings deteriorated in only a few months, leaving the steel unprotected, as shown in accompanying Fig 1.

In addition to prevention of corrosion, certain vessels and equipment in the plant also needed some form of insulation to eliminate condensation and decrease heat losses.

Solution: The steel structure and surfaces of equipment in nearly the entire

corrosion control

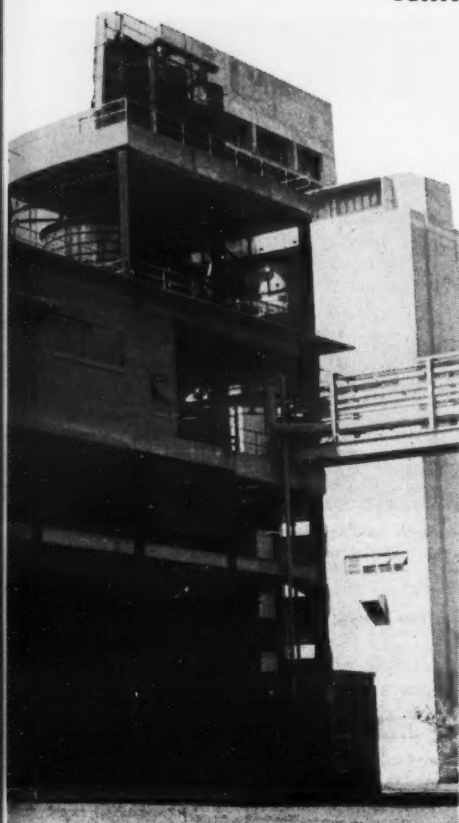


Fig 2—Since September of 1952, the asphaltic coating on the Steep House has resisted the effects of acid vapors and the corrosive salt air

plant were coated with a heavy, homogeneous asphaltic material, known as Insul-Mastic. Approximately 50% of the asphalt in the coating is Gilsonite, which is said to be much more resistant to chemicals and moisture than other types of asphalt. Coating contains from 40 to 55% mineral fillers, the greater portion of which is mica, the most serviceable of the commonly used fillers.

A number of different types of Insul-Mastic are available. At Corn Products, No. 4010 Vaporseal was used for the majority of the applications. It is designed for use on steel, iron, and other metals, as well as on masonry surfaces. This type can also be used over thermal insulation materials in conjunction with a woven glass fiber membranizing cloth. For applications where insulation as well as corrosion resistance is required, No. 553 Type "D" was used. It has the same chemical resistance as No. 4010, but also contains a high percentage of granulated cork, one of the most effective insulating materials.

Insul-Mastic No. 4010 was used for pro-

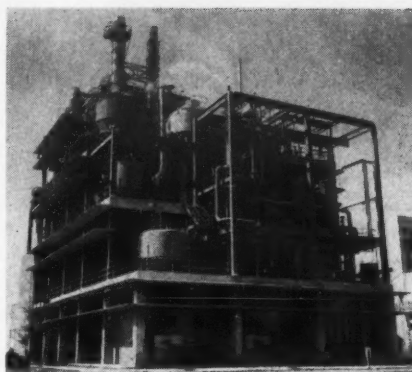


Fig 3—Attractive appearance of the plant is assisted by asphaltic coating on building where feed is manufactured

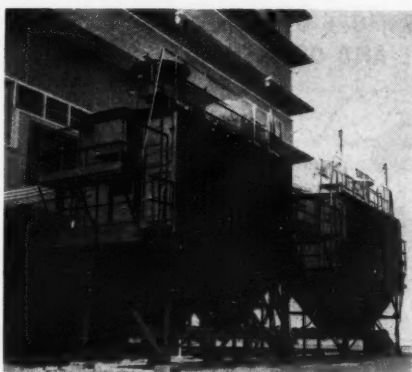
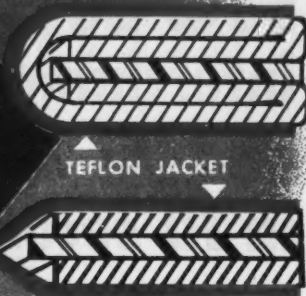


Fig 4—Dust collectors which were treated with coating to prevent corrosion

tecting the Steep House, shown in Fig 2. Behind this building may be seen the storage bins for milo maize, the raw material for the plant. At the Steep House, the grain is steeped in water containing a small quantity of sulfur dioxide. Acid vapors from this operation can cause excessive corrosion of the steel. All of the steel structure in this entire building, including pipes, stanchions, conduits, and other items were sandblasted and coated with a full 1/16" of the asphaltic material. This was completed in September of 1952.

(Continued on page 74)

THESE GASKETS FIGHT CORROSION!



CHEMPRO **TEFLON** JACKETED GASKETS

are far superior to ordinary gaskets for use under severe corrosive conditions. They last many times longer—even when handling stronger acids, halogens, organic solvents and other corrosives at very low, normal and even very high temperatures. They are now used for heat exchangers and columns, condensers, reactors and kettles. Where the application requires thick gaskets, Chempro Teflon Gaskets are less expensive and have better mechanical properties than solid teflon. Chempro Teflon Gaskets are made with an outer jacket of corrosive resistant Teflon and with a resilient and flexible core of compressed asbestos and laminated woven asbestos sheets. Other special core materials can be used depending upon your specific needs.

Chempro designs and manufactures a complete line of packings and gaskets in Teflon and other plastic materials. Look over the series shown below. There's a type to fit your special needs.

Style 10-1—Teflon* Jacket. Center core of compressed asbestos between woven asbestos cloth.

Style 10-2—Same as above but with corrugated Stainless Steel core. For higher operating pressures.

Style 10-3—Teflon Jacket. Compressed asbestos core 1/16" or 1/8" thick for applications where less deformability is needed or desirable.

Style 10-4—Teflon Jacket. Corrugated Stainless Steel insert. For high temperatures and pressures and low bolt loads.

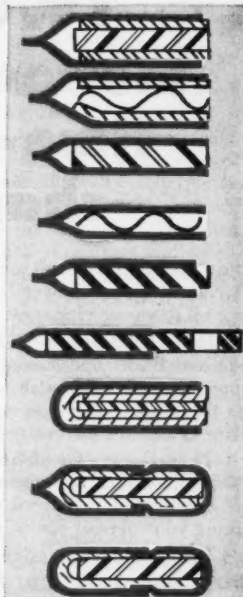
Style 10-5—Teflon Jacket. Neoprene core 1/16" or 1/8" thick. For applications requiring greater deformability.

Style 10-6—Teflon Jacketed Full Face Neoprene Gasket with Bolt Holes. Core may be of any construction or variety of specified material.

Style 20-1—Method of Teflon Jacketing special sizes, irregular shapes and diameters of 12" and over.

Style 220-1—Double Teflon Jacket using Envelope on I. D. and Molded Shield on O. D. for protection from extreme corrosion. Compressed asbestos center core between Woven Asbestos Cloth.

Style 221-1—Molded Shield Double Teflon Jacket for large diameters and special shapes and sizes.



Write today for a complete catalog.



CHEMICAL & POWER PRODUCTS, INC.
The Original Fabricators of Teflon Packings and Gaskets

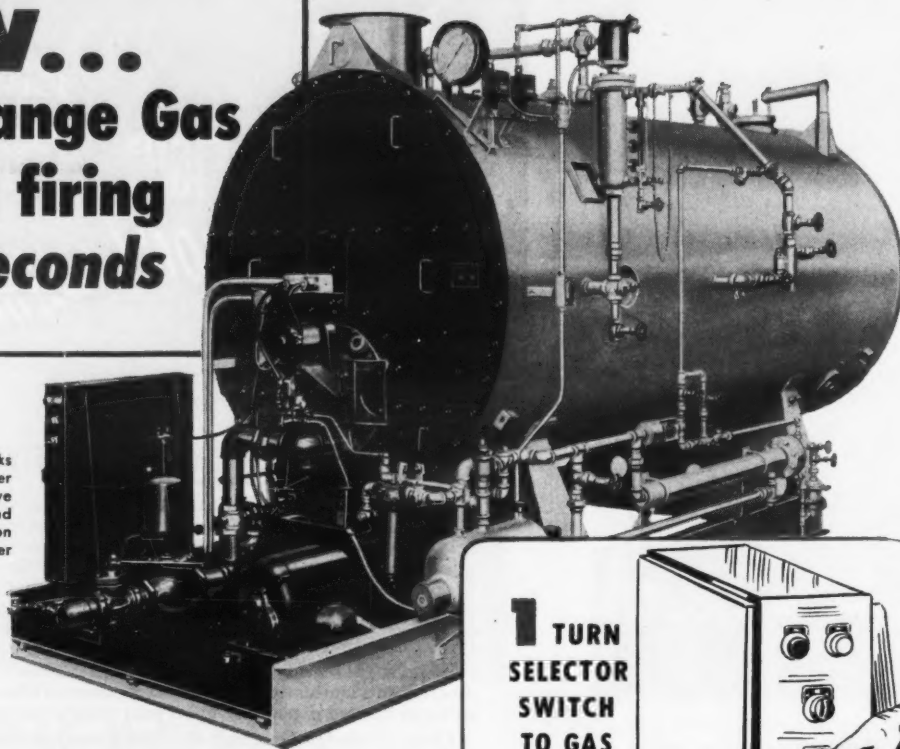
9 Broadway, New York 4, N. Y.

*du Pont Trademark

When inquiring check CP 5808 on handy form, pgs. 2-3

NOW... interchange Gas and Oil firing in 10 seconds

Modern Cleaver-Brooks
Model LR Steam Boiler
Equipped with Exclusive
Cleaver-Brooks "10-second
conversion" Combination
GAS and/or OIL Burner



TWO, simple motions eliminate time-consuming change-over

Now you can use oil or gas at the flick of a switch! This exclusive new Cleaver-Brooks development permits changeover from oil to gas or vice versa in only 10 seconds.

That's because the Cleaver-Brooks Combination Gas and/or Oil Fired Boiler operates on gas *with the oil burner in place*. Simply flipping a selector switch on the control panel to either gas or oil sets the proper circuit in action. Turning the convenient fuel supply valves completes the entire changeover — and in 10 seconds or less!

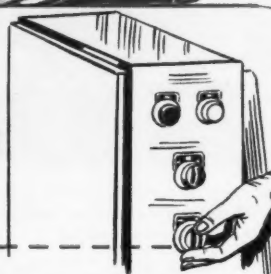
To gas users in all parts of the country — and in particular areas where local requirements demand immediate changeover — this exceptional fuel flexibility can be an important factor in determining your overall operating economy.

Ten-second conversion, like 4-pass construction, self-contained design, guaranteed 80% efficiency when firing with oil, is another "plus" feature pioneered by Cleaver-Brooks. It demonstrates Cleaver-Brooks' continuing effort to bring steam users even greater flexibility and reduced operating costs.

Consider Cleaver-Brooks boilers for simplifying your operation. Automatic firing on oil, gas or combination oil/gas fuels, plus extra conveniences, assure greatest investment return. Write for catalog.

BOILERS — STEAM OR HOT WATER — FOR HEATING AND PROCESSING, IN SIZES FROM 15 TO 500 HP, 15 TO 250 PSI

1 TURN
SELECTOR
SWITCH
TO GAS
OR OIL



2 TURN OFF ONE FUEL
LINE AND OPEN THE OTHER



Cleaver-Brooks

Originators of the
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Builders of Equipment for the Generation and
Utilization of Heat • Steam Boilers • Oil and Bitumen
Tank-Car Heaters • Distillation Equipment • Oil and
Gas-Fired Conversion Burners

When inquiring check CP 5809 on handy form, pgs. 2-3

CORROSION

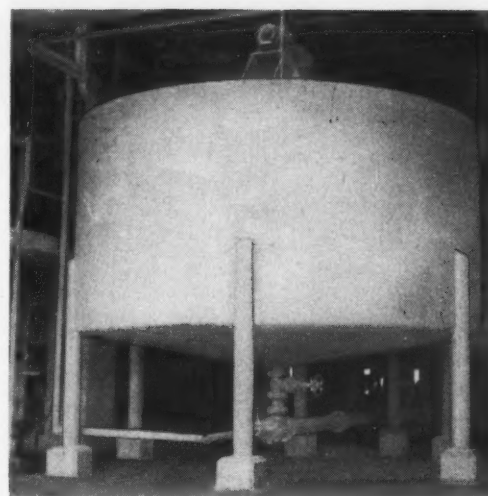


Fig 5—Starch holding tank which received a coating of the material to reduce temperature losses

(Continued from preceding page)

Another example of the buildings treated in this manner appears in Fig 3, a view of the plant where feed is manufactured. Structural steel, including the piping, grating, and non-insulated vessels were sandblasted and coated with No. 4010. Insulated vessels were vapor sealed with 4010, reinforced with Glas-Fab membrane fabric. This building was completed in March of 1952.

Fig 4 shows two Parsons dust collectors, which are used on the dryer and cooler in the adjoining Sugar House, where Cerelese sugar is dried. Unit on the left, which is used for the cooler, was coated to prevent corrosion. Steel was sandblasted and 1/16" of the coating applied. Temperature of this vessel ranges from 110 to 125°F.

Dust collector on the right, which is used for the dryer, varies in temperature from 270 to 300°F. It is insulated to prevent condensation. To vapor-seal the vessel, a tack coat of No. 4010 was first applied over the original 2" thick Foamglas covering the unit. One ply of Glas-Fab membrane fabric was then imbedded in the first coat and covered with 1/16" of 4010. Purpose of Glas-Fab is for reinforcement for film of mastic over joints of Foamglas block and for use as a flashing between block and adjoining metal. Coating on these vessels was completed in August of 1953.

Starch holding tank which received a coating of Insul-Mastic to reduce temperature losses is shown in Fig 5. This is a double-wall tank, the inside of which is stainless steel. Outside was treated with No. 553 Type "D", the cork impregnated coating. This coating has been in service since February of 1952. The vessel is maintained at 125°F.

Results: Coatings that have been in service in the plant for nearly two years are still in excellent condition in spite of the extremely corrosive at-

mosphere. They are not only protecting the equipment and buildings, but have also been made very decorative, as is evident from the photographs. A decorative spray can be obtained by using Insul-Mastic Aluminum Spray or certain synthetic base paints. Since an oil base paint will normally cause asphaltic coating to bleed through finish, only a few of the very fastest drying oil base coatings are satisfactory for this purpose.

Insulating value of the material is illustrated by its effect on the operation of the starch holding tank. Shortly after application of the coating, the temperature of the tank was increased 10°F, permitting a reduction in the steam used for the jet heater. Actually, it was very difficult to hold the desired temperature of 125°F before the coating was applied, even with the addition of extra steam.

(Coatings are manufactured by Insul-Mastic Corp. of America, Dept. CP, 1141 Oliver Bldg., Pittsburgh 22, Pa. . . . or for more information reader may simply check CP 5810 on handy form located between pages 2 and 3.)

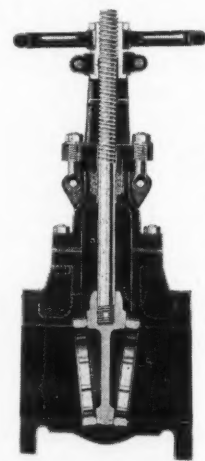
Mildly corrosive service is withstood by 3% nickel iron gate valve . . .

trim, where corrosion is often most severe, is stainless steel or Monel

Uses: For use in oil, pulp and paper, wood treating, and many chemical processing industries.

Features: Cast iron body and bonnet of valve contain 3% nickel, providing extra margin of corrosion-resistance over regular cast iron in many services. Trim, where corrosion often does the greatest damage, is of either 18-8 Mo stainless steel or Monel.

Description: Valve is designed to give economical service in installations where 100% stainless steel, Monel, or similar corrosion-resistant material is not needed. Disc-guides in iron valve bodies are precision machined. These guides hold disc in alignment as valve is closed, preventing pressure from forcing disc against opposite seat. As a result, disc cannot "chatter" and cause excessive wear as valve is operated.



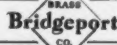
Sectional view of valve designed for economical service in mildly corrosive installations

(Three per cent nickel, 125 lb, iron gate valve is product of The Lunkenheimer Co., Dept. CP, Box 360, Cincinnati 14, Ohio . . . or for more information check CP 5811 on handy form, pages 2 and 3.)

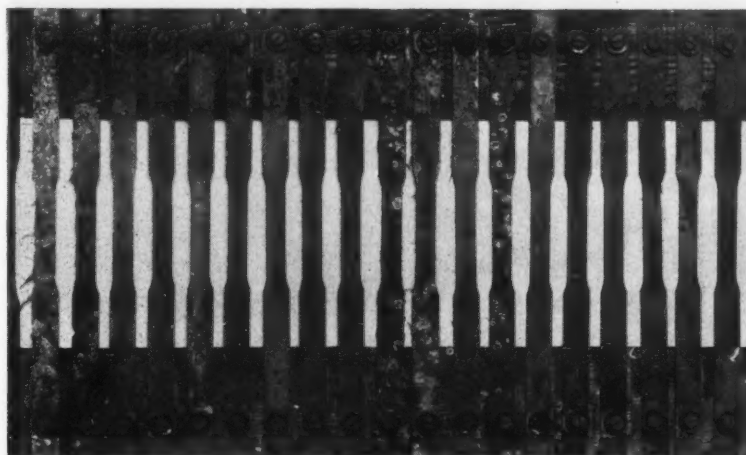
BRIDGEPORT BRASS COMPANY

CONDENSER AND HEAT EXCHANGER TUBE EDITION

COPPER ALLOY BULLETIN



MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND. — IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL



How various copper alloys respond toward biofouling in harbor water. The most corrosion resistant are the most affected by biofouling because of their solubility in sea water. This makes them less toxic to marine organisms, because their surfaces do not have a sufficient concentration of copper salts.

Good Cleaning Practices Increase Efficiency and Life of Tubes

The accumulation of foreign matter, such as slime, biofouling organisms, silt, cinders, and trash, lodging in condenser tubes, affect heat transfer and may lead to accelerated corrosion.

The problem of cleaning condenser and heat exchanger tubes and keeping them clean varies considerably from one plant to another.

In some plants rubber plugs have been found very satisfactory. The proper type and size depend upon the character of the silt or film to be removed. Rubber plugs, brushes, or scrapers usually are shot through the tubes by compressed air and water. The dumbbell type plug which has two wiping surfaces is quite popular.

Occasionally the cleaning implements are stopped by debris which may require "rodding." The best way to prevent debris from entering the tubes is by the proper use of strainers and screens.

Obstinate scales can often be dissolved by either inhibited acids or strong alkaline solutions which do not attack the tube itself. Chemical clean-

ing will be discussed in detail in a future Copper Alloy Bulletin.

Chlorination for Slime Prevention

A properly set up schedule of chlorination is very satisfactory for slime prevention. The chlorine concentration required varies with the character of the water. Over-chlorination should be avoided as it may injure the protective film and lead to accelerated corrosion. Generally, a red-brown or amber-colored film forms on the tube surface when the chlorination practice is satisfactory. This type of film is repeatedly found on tubes giving excellent results.

Excessive Chlorination Harmful

The resistance to corrosion from chlorinated waters varies with the alloy. Arsenical Admiralty (copper 70%, tin 1%, arsenic 0.03%, zinc remainder) and Muntz (copper 62%, zinc remainder) are not affected by mild-chlorine solutions but may be severely attacked by strong ones. Aluminum Brass (copper 77%, aluminum 2%, arsenic 0.02%, zinc remainder) and Durozone

IV, Aluminum Bronze (copper 94.25%, aluminum 5.5%, arsenic 0.25%) and the Cupro Nickel alloys are more resistant to chlorine solutions than the previously mentioned condenser tube alloys.

Biofouling Versus Corrosion Resistance

Biofouling of condenser tubes is associated with slowly moving sea water. In general, biofouling increases with the decrease in corrosion rate. Consequently, the high corrosion resisting alloys such as 70-30 Cupro Nickel (containing approximately 0.5% iron), Aluminum Brass and Durozone IV are highly susceptible to biofouling because of their low rates of solubility in sea water. The water film adjacent to the metal surface does not contain a sufficient concentration of copper salts to be toxic to marine organisms. Admiralty, Muntz, and Copper resist biofouling because of their higher solubility in sea water.

Biofouling organisms should be promptly removed from the tube surface by scrubbing with a stiff fiber brush and water. If the organisms are allowed to die and dry on the surface, considerable difficulty is experienced in removing those with calcareous bases such as barnacles. When not removed, such organisms and their decomposition products destroy the corrosion film and act as focal points for corrosion pitting. Decomposed organisms can lead to the formation of ammonia which may be followed by stress corrosion cracking of copper alloys with high zinc content.

Operation at a water velocity high enough to prevent organisms from attaching themselves is often helpful.

Technical Service Available

If you are contemplating retubing or are planning for new installations of condenser or heat exchanger tubing, consult the nearest Bridgeport sales office for technical help in selecting the alloy which will serve best for your particular operating conditions. Write on Company stationery for a copy of the 156-page Condenser and Heat Exchanger Tube Handbook. (965)

When inquiring check CP 5812 on handy form, pgs. 2-3



Checking Wear of "S" Monel sleeves after one year of service in midjet Jordan processing abrasive raw asbestos. Appearance of centrifugally-cast, 3½-inch O.D., "S" Monel sleeves indicate that they will outlast previous type of sleeves approximately 10 to 1.

**"We're getting," says Republic Seitz Filter Corp.,
"ten times as much service from these...sleeves."**

Let them show you what they discovered that helped them build extra wear resistance into these machine parts.

Sometimes abrasion is so severe that nothing you try seems to work.

That's how it was with the midjet Jordan machine Republic uses to process asbestos for antibiotic filters. The sleeves that protect the shaft against the abrasive asbestos lasted only 15 months. Then, just over a year ago, they discovered Cast "S"® Monel . . . learned what it does to combat abrasion.

This picture, taken when the Jordan was stripped just recently, shows part of what happened as a result of their change to "S" Monel. Look first at the left end of the part.

It rests on the centrifugally-cast "S" Monel intake sleeve. Can you see any wear?

How about the outlet sleeve . . . near the front of the picture? There is more pressure there, and even though the sleeve is "S" Monel, some scoring does show . . . but you can see, also, why Republic's engineers are enthusiastic . . . why they expect "ten times as much service" from their "S" Monel sleeves.

Formerly, wear was so severe they had to repack the glands once a week. But last year, with "S" Monel sleeves, they packed glands only six times. "In labor saving, alone," says a Republic official, "we have al-

ready gotten back the price of the "S" Monel sleeves."

A quick return on an "S" Monel investment is no novelty. It happens often. It can happen to you . . . for Inco Cast "S" Monel gives you in full measure a superior combination of resistance to abrasion and corrosion . . . at high temperatures as well as low. It's heat-treatable. It's non-magnetic. It's cast to last. "Cast to Last," by the way, is the title of a new folder on Inco Nickel Alloy Castings that could be useful to you. We'll be glad to send it to you if you write:

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

Inco Castings . . . Sand, Centrifugal, Precision



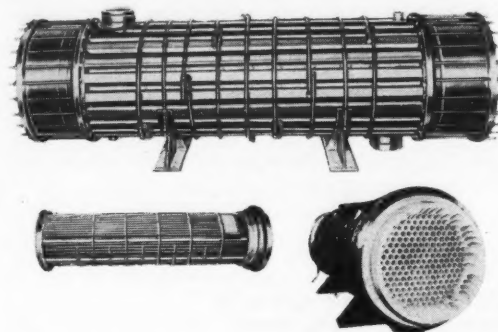
When inquiring check CP 5813 on handy form, pgs. 2-3

CORROSION

Corrosive liquids can be handled by pressure heat exchangers . . .

are designed to withstand 50 to 75 psi at temperatures up to 265°F

Recently announced line of pressure heat exchangers are designed to handle corrosive liquids or gases through tubes or shell. Units are molded from an acid-digested asbestos bonded with synthetic resins. Pressure range of line is 50 to 75 psi with a wide margin of safety. The material is resistant to thermal shock and can be safely used continuously at temperatures up to 265°F.



Side and end views (top and lower right) show external construction of corrosion-resistant standard pressure heat exchanger. Typical tube bundle is shown at lower left

Construction of the heat exchangers consists of an outer shell, fixed and floating tube sheets 2½" thick, heads, baffles, and impingement plates all of Haveg. Outer shell is reinforced with wood staves and steel hoops. Many types of packing are available. Gaskets of Neoprene, Teflon, rubber, or asbestos composition may be supplied to seal off the tube sheets. Auxiliary equipment, such as pumps, valves, pipe, and fittings can be furnished with the corrosion-resistant, asbestos-resin material.

Standard pressure sizes range from 13¼" to 29¼" inside diameter with single or multi-pass interchangeable heads. Since the material is molded, larger sizes up to 10' in diameter can be made for coolers and low pressure heat exchangers. Customer designs can easily be adapted to this type of construction, with any type of tube bundle supplied.

(Pressure heat exchangers are product of Haveg Corp., Dept. CP, Marshalltown; Del. . . or for more information check CP 5814 on handy form, pages 2 and 3.)

Covers acid-proof coatings

Four-page bulletin describes materials which are reported to give the highest type of vinyl and butadiene styrene acid-proof resin protection against acids, alkalis, and many solvents. Products, known as Duro-Kote and Duro-Kote 57, are

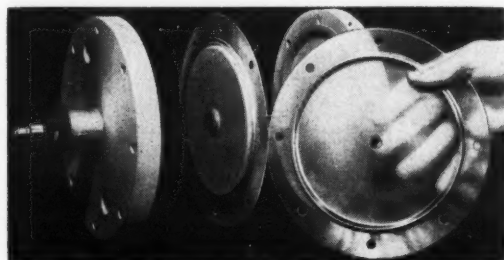
useful in metal finishing and in many branches of the chemical and food industries.

Bul DK-1-53 is issued by Electro-Chemical Engineering & Mfg. Co., Dept. CP, 750 Broad St., Emmaus, Pa. . . . or for more information check CP 5815 on handy form, pages 2 and 3.

Chlorine gas kept in check by fluorocarbon film diaphragms . . .

flexibility and strength of plastic permit chlorinator to maintain set feed

Three paper-thin diaphragms made of Kel-F polymer film keep highly-corrosive wet chlorine gas in check in the Fischer & Porter Company's Ratochlor chlorinator used in chemical and drug processing plants. Each diaphragm, consisting of 5 mil film, retains



Fluorocarbon film diaphragms for chlorinator remain resilient over temperature range from minus 180 to plus 300°F

its flexibility and strength under countless flexing and exposure to wet chlorine gas. This permits the chlorinator to maintain a set feed within a fraction of a per cent at all times.

In contrast with other materials tested for this application, the fluorocarbon film was found to remain resilient enough over a wide temperature range (minus 180 to plus 300°F) to act as its own gasket. Exceptionally low "plastic cold flow" of the fluorocarbon made special retaining rings unnecessary — diaphragm does not extrude under pressure.

Another advantage is that dismantling of diaphragm-equipped assemblies, vacuum and pressure regulators and vacuum breaker, is now simplified. Plastic diaphragms will not "freeze" to housings, therefore allowing re-use. Non-porosity and zero water absorption of material prevents undesirable transmission of water into "dry" sections of equipment.

Freedom of the plastic from plasticizers eliminates problem of effluent gas contamination. Another interesting feature of diaphragms is that they are virtually self-cleaning, the fluorocarbon plastic's "non-stick" characteristic reducing need for cleanouts.

(Kel-F fluorocarbon film is product of Chemical Mfg. Div., The M. W. Kellogg Co., Dept. CP, P.O. Box 469, Jersey City 3, N. J. . . . or for more information check CP 5816 on handy form, pages 2 & 3.)

NEW PROTECTIVE COATING CHEMICAL FOR ALUMINUM

ALODIZING

Alodizing with "Alodine,"* a new technique in the protective coating of aluminum, was made available for production-scale use in 1946. Since that time Alodizing has largely supplanted the more elaborate, costly and time-consuming anodic treatments in the aircraft and other industries.

Continuous and successful industrial use has clearly demonstrated the simplicity and economy of the Alodizing process as well as the effectiveness of the "Alodine" amorphous coatings, particularly as a base for paint. In fact, the paint-bond that Alodized aluminum provides has been found to be superior to that possible with chromic acid anodizing.

The corrosion-resistance of unpainted aluminum Alodized with "Alodine" Nos. 100 or 300 is excellent, easily meeting the requirements of Specification MIL-C-5541. However, a need for protection of unpainted aluminum, even better than that obtained with chromic acid anodizing, has long been recognized.

NEW IMPROVED "ALODINE" DEVELOPED By ACP RESEARCH CHEMISTS

Several years of intensive research have now led to a new type of "Alodine," designated as "Alodine" No. 1200. This new protective coating chemical forms an amorphous mixed metallic oxide coating of low dielectric resistance that provides unusually high corrosion-resistance for unpainted aluminum. In addition, it forms an excellent paint bond that approaches closely the high quality obtained with the earlier types of "Alodine."

After having been tested for conformance with Specification MIL-C-5541, "Alodine" No. 1200 is now about to go into production.

PROCESS DETAILS

"Alodine" No. 1200 is the only essential chemical needed to prepare the coating bath and the final rinse bath. One of its unique features is that it can be used in tanks in an immersion process, or, in a multi-stage power washer in a spray process, or, with a slight adjustment of pH, with brush or portable spray equipment in a manual process. This means that even where the simple production equipment is not available, or where touching up of damaged coatings previously Alodized or anodized is required, excellent protection and paint bonding can still be obtained with practically no equipment.

*"Alodine" Trade Mark
Reg. U. S. Pat. Off.



AMERICAN CHEMICAL PAINT COMPANY

General Offices: Ambler, Penna.

Detroit, Michigan

Niles, California

Windsor, Ontario

All three methods of application easily meet the requirements of Specification MIL-C-5541.

Process sequence for all three methods of application is the same as for other standard grades of "Alodine" such as Nos. 100, 300, and 600, viz.: 1. Pre-cleaning. 2. Rinsing. 3. Alodizing. 4. Rinsing. 5. Acidulated rinsing. 6. Drying.

Coating time in an immersion process ranges from 2 to 8 minutes and in a mechanized spray process is about 30 seconds. "Alodine" No. 1200 baths are operated at room temperatures (70° to 100°F.) and heating is required only if the bath has gotten cold after a "down" period.

RECOMMENDED USES FOR "ALODINE" No. 1200

"Alodine" No. 1200 is specifically recommended for coating wrought products that are not to be painted or are to be only partially painted; and for coating casting and forging alloys whether or not these are to be painted. "Alodine" Nos. 100 and 300 are still recommended for coating wrought products such as venetian blind slats, awnings, etc., that are invariably painted.

RESULTS OF TENSILE TESTS

This new "Alodine" not only retards visible corrosion and pitting, but as shown in the table below, the loss of ductility with "Alodine" No. 1200 both brush and dip after 1000 hours salt spray was less than for chromic acid anodizing after 250 hours, and for "Alodine" No. 100 and a conventional chromate treatment after 168 hours exposure.

PROCESS	SALT SPRAY EXPOSURE	COMPLIANCE WITH TENSILE REQUIREMENTS OF MIL-C-5541
CHROMIC ACID ANODIZING	168 hrs. 250 hrs. 500 hrs. 1000 hrs.	passes passes fails fails
BRUSH "ALODINE" No. 1200	168 hrs. 250 hrs. 500 hrs. 1000 hrs.	passes passes passes passes
DIP "ALODINE" No. 1200	168 hrs. 250 hrs. 500 hrs. 1000 hrs.	passes passes passes passes
DIP "ALODINE" No. 100	168 hrs. 250 hrs. 500 hrs. 1000 hrs.	passes fails fails fails
CONVENTIONAL CHROMATE TREATMENT	168 hrs. 250 hrs. 500 hrs. 1000 hrs.	passes fails fails fails

When inquiring check CP 5817 on handy form, pgs. 2-3



For RUSTY STEEL, Too, a Topcoat is NOT Enough!

You Need **Rustbond Primer**

Ever try a topcoat by itself to keep from freezing?

You do pretty much the same thing when you apply a top finish of paint on rusty steel to keep it from corroding. Rusty steel requires an undercoat that both permeates and inactivates rust. Carboline Rustbond Primer provides such an undercoat, makes every finish coat perform better.

In over 400 field tests on structural steel primers, Carboline Rustbond Primer has substantially upgraded finish coatings made of vinyls, phenolics, neoprenes, synthetic and chlorinated rubber, epoxies, waxes and modified tung oils. It ties these finishes securely to rusty steel. It improves corrosion resistance, reduces "creep" and edge failure.

Rustbond Primer adds maintenance-free life to your paint job.

Rustbond Primer is easy to use. Brush it right over wirebrushed rusty steel. No sandblasting.

Bulletin 150 gives complete details, with full color photographs of comparative tests.

WRITE FOR BULLETIN 150

CARBOLINE
RUSTBOND PRIMER

CARBOLINE COMPANY

329 Thornton Avenue St. Louis 19, Mo.

Specialists in Corrosion Resisting Synthetic Materials

When inquiring check CP 5818 on handy form, pgs. 2-3

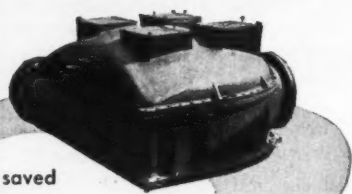
For More Than 50 Years...



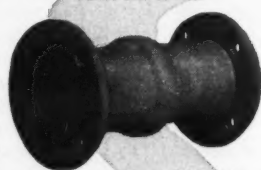
Sturdy, long-lived acid pails

... La Favorite Rubber Engineering has saved industry Millions of Dollars by inhibiting corrosion of process equipment through rubber lining and/or covering of pipe, tanks and hundreds of variations in process equipment.

The La Favorite method, developed over the years, has consistently proved its merit as a primary source of corrosion protection. Inspection of equipment in use for many years after lining and/or covering has disclosed that the La Favorite method of application and compounding of the rubber stock have always been equal to the life of the rubber.



This large sea-going condenser was completely lined, including baffle and covers.



One of several all-rubber expansion joints for the power plant of a public utility.

For details on lining or covering of processing lines and equipment, send blue prints for estimate of cost, or write for bulletins on your type of equipment.

LA FAVORITE RUBBER MFG. CO.

747 Wagaraw Road

Hawthorne, N. J.

RUBBER LININGS • RUBBER COVERING • RUBBER ENGINEERING

When inquiring check CP 5819 on handy form, pgs. 2-3

CORROSION

Corrosion control method uses polyvinyl chloride resin coatings . . .

are flowed and fused on metal surfaces

A different approach in the use of polyvinyl chloride plastic to prevent corrosion may be found in the application of a coating of this material in the form of a paste resin to metal surfaces. Coatings



Acid fume exhaust ducts coated with polyvinyl chloride

are flowed on and fused on metals. Thickness of coating is from 1/32 to 3/16" or more. It is resistant to mineral acids, alkalis, and other chemicals. Coating withstands abrasion and mechanical abuse.

Types of metals treated include carbon steel, copper, aluminum, stainless steel, and others. Coating is applied to such items as fume exhaust stacks, blowers, scrubbers, and as linings on tanks, and on complicated fabrications and castings subjected to corrosion.

(Product of Quelcor, Inc., Dept. CP, Front and Broomall St., Chester, Pa. . . or for more information check CP 5820 on handy form, pages 2 and 3.)

Glass pipe and fittings covered in catalog

Corrosion-resistant Pyrex glass pipe and fittings are described in illustrated catalog. Line of sink traps and fittings are introduced, in addition to regular stock items. Physical properties of glass are discussed, along with specifications of valves, flanges, joints, pipe, and other units.

Bul on Pyrex glass pipe and fittings is issued by Corning Glass Works, Dept. CP, Corning, N. Y. When inquiring specify CP 5821, pgs. 2-3.

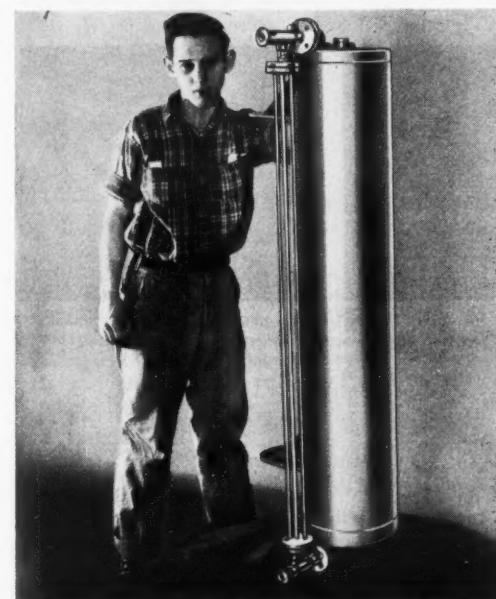
AGILENE **AGILIDE**

The Most Economical Answer

TO YOUR CORROSION PROBLEMS

IN CHEMICAL PROCESS EQUIPMENT

Agile's high-grade thermoplastic construction materials—AGILENE and AGILIDE—fabricated by a combination of forming and welding processes in which we specialize, are your safeguard for an economical and properly engineered installation.



AGILIDE tower fitted with sight glass and valves. Brackets on side are for mounting tank to wall or column. Made of 1/4" AGILIDE, 48" high, 9" outside diameter. This fabrication was made for American Cyanamid Company, Stamford, Conn.

SEND YOUR INQUIRIES TO

American Agile Corporation

Plant and General Offices • 5461 Dunham Rd., Maple Heights, Ohio
Mailing Address, P. O. Box 168 • Bedford, Ohio

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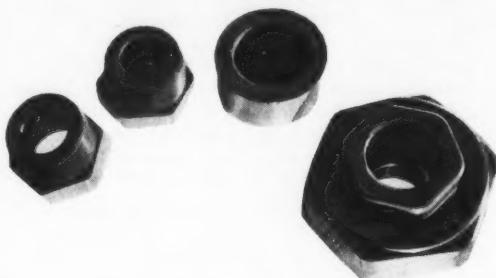
When inquiring check CP 5822 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Complete piping systems for corrosives allowed with addition of fittings to line of plastic pipe . . .

are made of unplasticized polyvinyl chloride

Uses: Material is used in industries such as textile, beverage, tanning, plating, dyeing, chemical, and petroleum wherever chemical resistance to organic and inorganic acids, alkalis, alcohol, and foodstuffs is needed.



Unplasticized polyvinyl chloride fittings

Features: Addition of reducing bushings, plugs, unions, and caps to manufacturer's line of unplasticized polyvinyl chloride pipe and valves makes possible complete piping systems for handling corrosives.

Description: Boltaron 6200 (unplasticized polyvinyl chloride) fittings are made in standard IPS sizes ranging from $\frac{1}{8}$ to 2". Material, which is non-toxic, is also available in rods and sheets.

(Boltaron 6200 fittings are product of H. N. Hartwell & Son, Inc., Dept. CP, Park Sq. Bldg., Boston, Mass. . . . or for more information check CP 5823 on handy form, pages 2 and 3.)

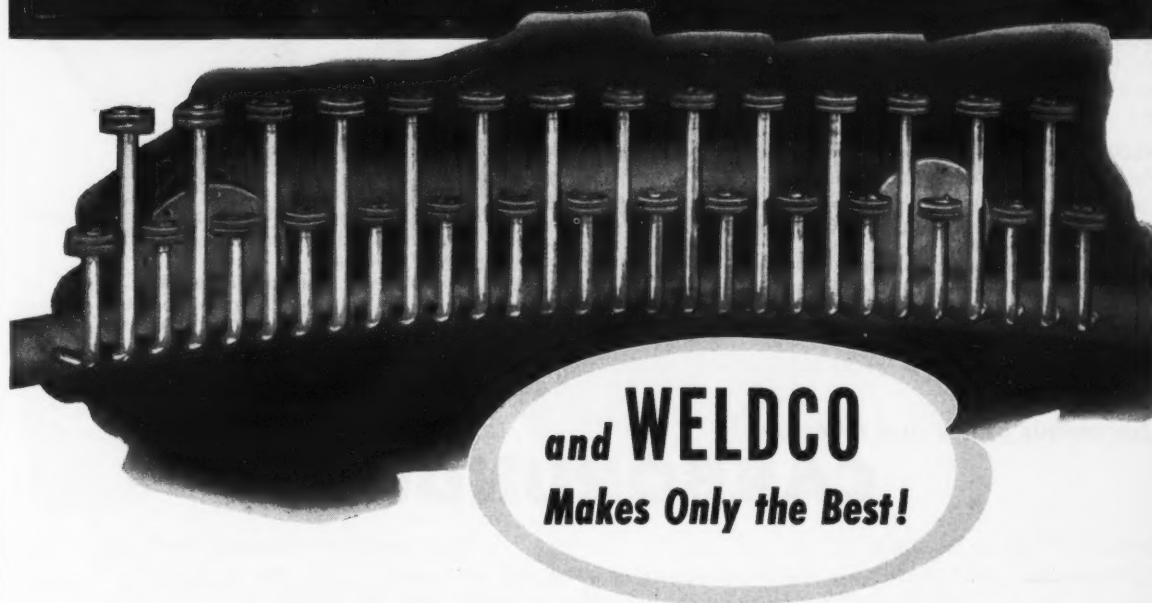
Corrosion resistance of austenitic stainless steels

Corrosion resisting properties of austenitic chromium-nickel stainless steels, developed as result of tests, are described in detail in 32-page, 18-table bulletin. Alloys were tested in various solutions, acid, alkaline, and neutral. Publication includes information on mechanism of corrosion resistance in stainless steels and factors affecting corrosion. Preferred practice in construction and use of stainless steels is also covered.

It is shown that nickel in combination with chromium increases corrosion resistance in both oxidizing and reducing solutions. In addition, it has desirable effects in promoting austenitic structure and maintaining it during and following fabrication.

Bul A-49 is issued by The International Nickel Co., Inc., Dept. CP, 67 Wall St., New York 5, N. Y. When inquiring check CP 5824 on handy form, pages 2 and 3.

It Takes GOOD TUBING To Make GOOD PIPING...



and WELDCO
Makes Only the Best!

The stainless steel piping, shown in the photo above, required the best tubing available. WELDCO was chosen for this important job because it met the rigid specifications of the buyer. It was selected, also, because of its excellent fabricating qualities . . . easy to bend, form, weld and assemble.

WELDCO is lightweight and corrosion-resistant . . . has a smooth inside finish,

exceptional strength, and complete uniformity throughout. It's available in Stainless Steel, Monel, Inconel, Nickel, and Cupro-Nickel, in tube and pipe sizes from 3" to 30", Schedules 5 and 10, and 3" to 12", Schedule 40.

Whenever you need dependable tubing for special problems—for regular applications—specify WELDCO, your best buy in top-quality tubing.

Whatever Your Needs In Tubing . . . You're 'Way Ahead With WELDCO

THE YOUNGSTOWN WELDING & ENGINEERING CO.
3721 OAKWOOD AVE. . . . YOUNGSTOWN, OHIO

When inquiring check CP 5825 on handy form, pgs. 2-3

FOR BETTER WATER FILTRATION

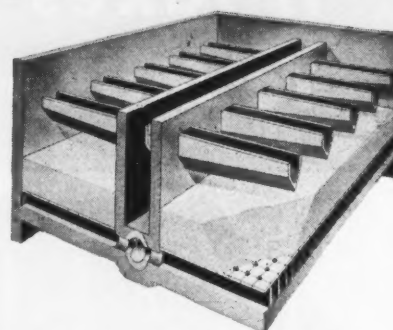
...ALOXITE porous underdrains

When you eliminate graded gravel and support your filter media with porous plates — specifically, ALOXITE aluminum oxide underdrains — you automatically derive these benefits:

Since the backwash discharges under the *entire* bottom surface of the filter media, cleaning can be done quicker, more thoroughly, and with less wash water. There are no mud balls, no upset beds to rebuild, and no chance of losing filter media through the underdrain.

ALOXITE bottoms also reduce the required height of the filter (by nearly the total height of the gravel). Hence, you save on new construction costs. Or, if rebuilding, the added space can be used to increase operating head, to step-up back washing, or for deepening the filter bed.

ALOXITE plates are resistant to practically all acids, and can be used safely up to 900°C. Their uniform grain structure and glass-like bond keep pressure loss to a minimum, permit maximum flow through the filter. They are easy to install, easy to operate, easy to maintain. Hundreds of ALOXITE bottoms are in service today — some in their 15th year.



Typical false bottom structure showing installation of porous underdrain plates and filter media.

YOU'LL WANT OUR POPULAR BOOKLET. It's the up-to-date reference source on porous media. Its 56 pages cover all fields of filtration and diffusion — including information on application, specification, designs, installation and operation. Write for free copy.



Use porous plates and tubes by

CARBORUNDUM

Trade Mark

Dept. S-14, Refractories Division

The Carborundum Company, Perth Amboy, N. J.

"Carborundum" and "Aloxite" are registered trademarks which indicate manufacture by The Carborundum Company. When inquiring check CP 5826 on handy form, pgs. 2-3

On Latex Paints...

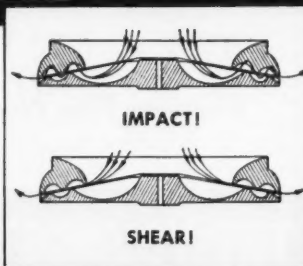
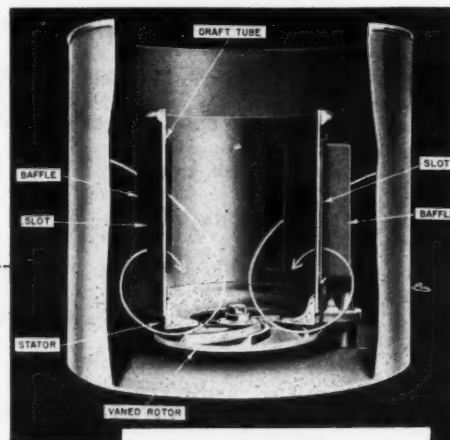
Get **COMPLETE** Dispersion
of **ALL** Ingredients
Regardless of Formulation

With the **ABBÉ DISPERSALL MIXER** you can...

- Cut mixing time in half (or better)
- Get maximum color dispersion from a minimum amount of color
- Do the entire job in **ONE** machine...over the entire range of your color card
- Fill directly from the mixer or pump to storage
- Run red...or blue...or green and be ready for white in ten minutes
- Pay off the first cost in less than a year

The complete story is
in Catalog 68. Write
for a copy.

Note the combined impact and shear of the rotor-stator phase of this mixer, added to the vigorous turbulent mixing action. That's why it's the best mixer available for latex-based paints...and any other fluid mixing operation where break-up of lumps and air bubbles is important!



ABBÉ ENGINEERING COMPANY

46 CHURCH STREET
NEW YORK 7, N. Y.

When inquiring check CP 5827 on handy form, pgs. 2-3

Briefs

Resources for chemical industries in the Rocky Mountain States

Availability of raw materials in Idaho, Montana, New Mexico, and Wyoming is covered under the headings of agriculture and forests, minerals, geology, petroleum and gas, nonmetallic minerals, and water. Informative discussions of educational and research facilities, water resources, electric power, plant construction factors, and trends of chemical industry and markets are given. Consideration is accorded fiscal and tax matters, interstate transmission lines, headwater reservoirs, labor, consumer products, and structural materials. 59 pages, 40 tables, 31 figures, 316 references. ("Industrial and Engineering Chemistry," Nov. 1953, page 2423.)

Status of tin

This survey of tin covers its distribution, properties and uses. Productions by countries are listed and attention is given to methods or recovery of the ores and to tin plate. 2 pages. ("Canadian Mining Journal," Oct. 1953, page 71.)

Compounding with powdered reclaim rubber

Reclaim rubber in powdered form promotes uniformity and improved dispersibility in the compound. Compared to conventional reclaims, powdered reclaim exhibits favorable physical properties, requires less power, and results in a cooler mix. Exhaustive and informative tests are reported on compounds that contain natural rubber and GR-S. Seven pages, 7 tables, 4 figures. ("Rubber Age," September 1953, page 785)

Choice of correct insulation for pipes

From The Netherlands come charts, fully supplemented with discussion and illustrations of use, to enable choice of economical insulation for pipes. Wide ranges of temperature difference, conductivity, pipe size, and costs are covered. 4 pages, 4 figures. ("Power," Nov. 1953, page 78.)

Induced polymerization of methyl methacrylate

When methyl methacrylate is polymerized by its own polymer, the extent of reaction is linear with time to 5 per cent conversion at 60°-90°C. The

from contemporary publications

Here's a quick look at interesting articles,
appearing in other publications . . .

rate of reaction is proportional to the concentration of the added polymer, but is independent of its molecular weight. Discussion of the nature and rate of initiation of the reaction is presented. Polymer-induced polymerization for other systems was not observed. 6 pages, 4 figures, 1 table. ("J. Polymer Science," Oct. 1953, page 299.)

Boiler water

In connection with boiler water, the following aspects are discussed: flow of heat through tube wall, flow of water within the tube, film boiling, "concentrating film," pure water, hydroxyl ions, "captive alkalinity," acid cleaning, and removal of silica. 7 pages, 5 figures, 22 references. ("Consulting Engineer," Oct. 1953, page 28.)

Centrifuging suspended solids

A hand-driven centrifuge fitted with glass tubes is used to precipitate solids suspended in white water. Effects of ratio of filler to fiber, consistency, and shape of tube are presented. With suitable calibration curves, determination of concentration of solids in white water from pulp and paper mills can be made in 2 minutes instead of 24 hours as required by the TAPPI standard method. 3 pages, 2 figures. ("Tappi," Oct. 1953, page 467.)

Air pollution in the steel industry

A four-paper symposium devoted to control of pollution, electrical precipitation, dust and fume problems, and electric air cleaning presents applications to open hearths, bessemer converters, blast furnaces, sintering plants, coke ovens, and blooming mills. 20 pages, 2 tables, 16 figures. ("Iron and Steel Engineer," Oct. 1953, page 91.)

Neoprene compounded to resist water

This study of the effect of water on neoprene compounds covers test procedures, and effects of vulcanizing agents, fillers, softeners, type of neoprene, temperature, and curing with Pb_3O_4 , PbO , and $ZnO-MgO$. 6 pages, 6 tables, 9 figures. ("Rubber Age," Oct. 1953, page 72.)



For Immediate Deposit!

Buell Engineers have made an *exact* science of the recovery of valuable industrial dusts. With the help of Buell equipment, many of America's Leading Corporations make substantial cash savings every day.

Buell's specialized knowledge and experience make possible a scientifically accurate forecast of efficiency and economy before you spend a single penny. You see, Buell specialists study dust content and

operating conditions and submit a written report on effectiveness in advance.

We are always glad to supply the names of present users of Buell equipment right in your own field. Their year 'round experience is our best selling point!

Send for our informative Brochure—The Collection and Recovery of Industrial Dusts. It explains *all three* Buell systems of industrial dust collection. Write Dept. 11-A today for your complimentary copy. Buell Engineering Company, 70 Pine Street, New York 5, N. Y.

buell



20 Years of Engineered Efficiency in
DUST COLLECTION SYSTEMS

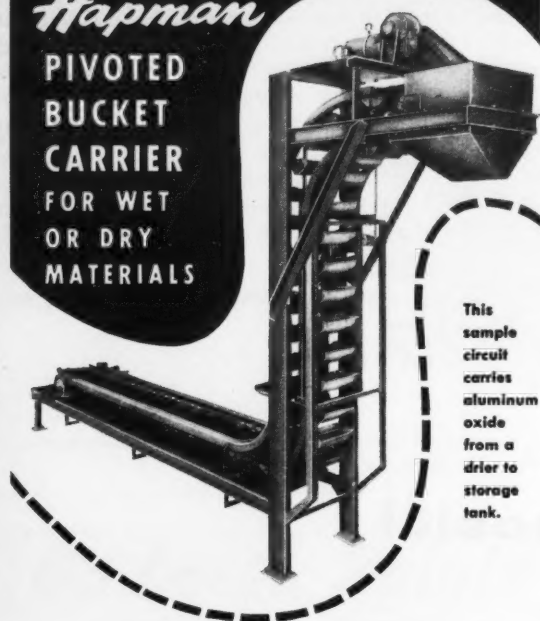
When inquiring check CP 5828 on handy form, pgs. 2-3

HERE'S HELP!

GAIN UNIQUE ADVANTAGES
WITH THE

Hapman

PIVOTED
BUCKET
CARRIER
FOR WET
OR DRY
MATERIALS



This sample circuit carries aluminum oxide from a drier to storage tank.

MANY CIRCUIT LAYOUTS POSSIBLE— HANDLES FRAGILE CRYSTALS, LUMP OR POWDERED MATERIALS

One of *your* tough problems in materials handling may be happily solved by the *unique* patented features of this Hapman Carrier design.

Circuits of many types can be built . . . to carry fragile crystals, corrosives, abrasives and other "problem" materials . . . at speeds to 60' per minute—100 tons per hour. Design permits *gentle* automatic top-loading—automatic unloading and unusually long life.

There's *much more* that may interest you—

WRITE FOR PIVOTED BUCKET BULLETIN CP-154

Hapman CONVEYORS, INC.
DIVISION HAPMAN-DUTTON COMPANY
KALAMAZOO MICHIGAN

When inquiring check CP 5829 on handy form, pgs. 2-3

material handling



Fig 2—Materials handling installation at Koppers shows A) bucket elevator, B) silos, C) weighhoppers

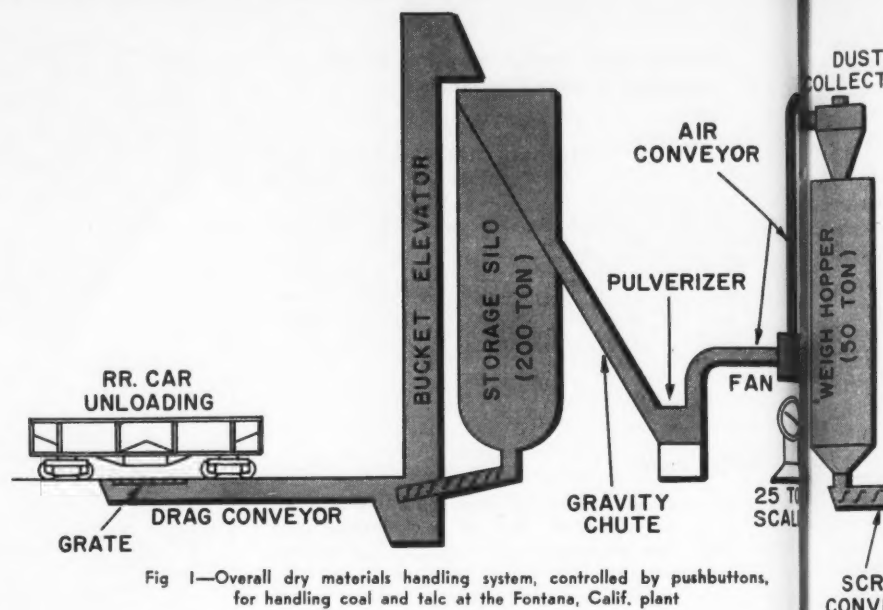


Fig 1—Overall dry materials handling system, controlled by pushbuttons, for handling coal and talc at the Fontana, Calif. plant

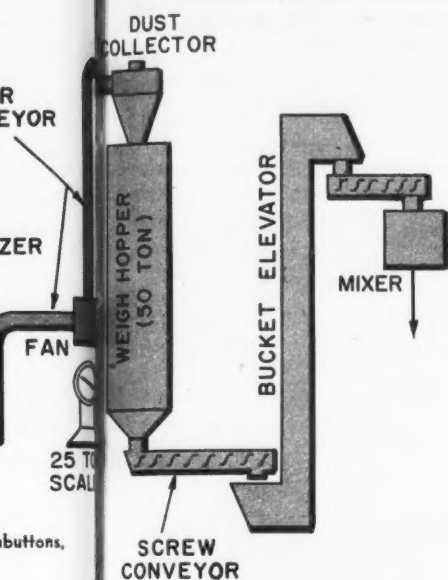
*pushbuttons keep coal, talc moving
for processing into enamel-talc*

Dust is practically negligible with use of enclosed conveyors; labor costs are cut, maintenance reduced

Problem: Handling of talc and coal from hopper rail cars or trucks for producing coal-tar enamels at the newly-built Fontana, Calif. plant of Koppers Co., Inc. called for a simplified system that would cut labor and maintenance costs for company's Tar Products Div.

Solution: In processing, coal is emptied from 50-ton hopper rail cars into a grating between the rails and delivered by gravity to a 2-ton track bin which is continuously emptied by a totally enclosed drag-type conveyor 26' long and 24" wide and is equipped to handle the coal at a 25-30 ton/hr rate.

The lead-in conveyor, powered by a 5 hp motor, delivers coal to a bucket conveyor which lifts the material to one of two 200-ton capacity silos. (Similar silo is also used for talc handling.) When silo is full, coal reaches a slanted chute at the top which directs it by gravity into a Strong-Scott unit pulverizer. At base of silo is a 3 hp powered conveyor which can recycle coal from storage tower



al, to moving in bulk quantities
ing into al-tar enamels

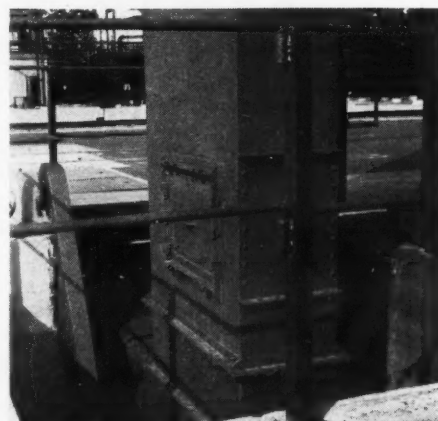
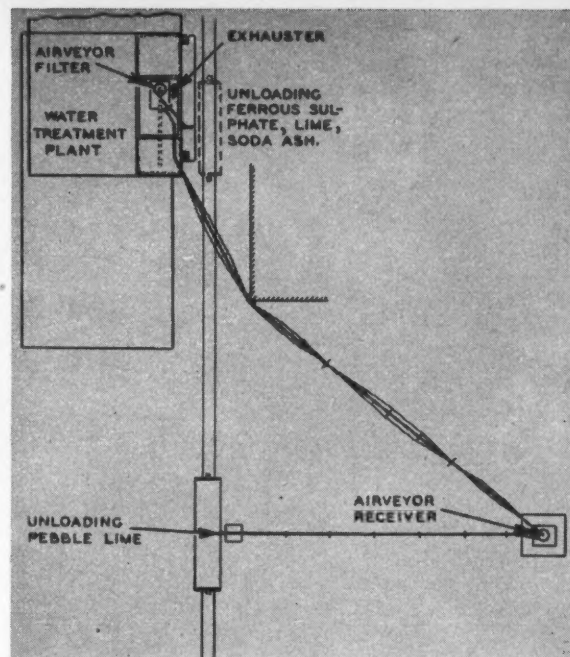


Fig 3—Conveyor junction where drag-type conveyor delivering material from under railroad track dumps into bucket elevator

back up to top of silo and into pulverizer by gravity.

After going through pulverizer, coal is carried by an air conveyor having a 20 hp blower to a 50-ton weigh hopper scale-and-beam suspended and built directly over a 12"-wide screw conveyor.

(Continued on page 85)



Conveying three different materials with **AIRVEYOR**



The Airveyor may be used to convey more than one material, because it is self-cleaning, self-scouring. At the end of the day, or run, the air used for conveying cleans out the system. It is then ready to handle an entirely different material, without contamination.

In this plant, Airveyors handle three different materials: lime, ferrous sulphate, and soda ash. Two widely separated unloading stations are employed, one for unloading lime to storage, for use in the manufacturing process; the other system unloads all three materials for a water-treatment plant.

A two-stage cyclone-receiver is used in the lime-unloading station, the fine dust being returned to a four-compartment filter-receiver in the water-treatment plant, through an air-return line. Each system has an unloading capacity of $7\frac{1}{2}$ tons an hour. One exhaustor furnishes air for the two systems.

If your problem involves bulk handling of dry pulverized and granular materials, call on Fuller's 26 years of specialized experience in handling materials by air. You can save time and money by consulting Fuller . . . get in touch with us while your plans are in the formative stage. This service places you under no obligation.

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A-163
1959

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—COMPRESSORS AND VACUUM PUMPS—FEEDERS AND ASSOCIATED EQUIPMENT

When inquiring check CP 5830 on handy form, pgs. 2-3



How a Bulk-Handling Tractor Pays Its Way Even in a Liquid-Producing Plant

The Allis-Chalmers HD-5G Tractor Shovel is well known to industry for its efficiency on such jobs as loading, stockpiling, feeding hoppers and conveyers. But its usefulness is not confined to bulk-handling plants. For example, one large producer of flammable liquids finds that the HD-5G has more than paid its way for the past five years handling a wide variety of jobs.

DIGS TANK FOUNDATIONS

One of its duties is to help install new tanks. On this operation, the HD-5G does much of the excavating for foundations. Sometimes the size of the excavation or the presence of obstructions makes it necessary to dig by hand. In this case, the Tractor Shovel loads the excavated material into trucks.

BUILDS FIRE WALLS

Another important job assigned to the HD-5G is building fire walls around storage tanks. Earth for fire walls is obtained from nearby fields. Here the Allis-Chalmers Tractor Shovel strips and loads the earth into trucks. After trucks have delivered earth to the site, the HD-5G shapes and compacts the wall with its bucket and crawler tracks. From time to time it is necessary to remove fire walls for installation of new tanks. This, too, is handled by the HD-5G.

TEARS UP OLD ASPHALT

General plant maintenance also gets a hand from the

Allis-Chalmers Tractor Shovel. When it became necessary to rebuild plant roads, the HD-5G quickly ripped up the old asphalt and loaded it into trucks.

WORKS WITH INTERCHANGEABLE ATTACHMENTS

Because of its power, traction and versatility, the HD-5G is constantly called upon to handle non-routine jobs. The standard one-cubic-yard bucket is quickly interchanged with an eight-foot bulldozer blade. With this attachment, the HD-5G clears and levels land for new construction, builds or removes dikes around earthen settlement tanks and maintains unpaved yard roads.

Other interchangeable attachments for the HD-5G include an Angledozer Blade, Lift Fork for pipe, lumber or packaged loads, Trench Hoe for pipe laying and digging foundation footings, Crane Hook for moving heavy machinery and various buckets for rock, light materials and other specialized applications.

Ask your Allis-Chalmers dealer to show you how the versatile HD-5G can increase efficiency in and around your plant.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U.S.A.

MATERIAL HANDLING

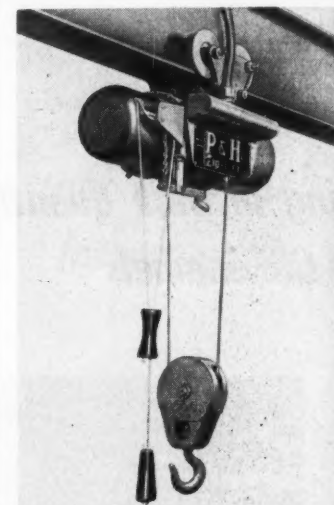
One-hand control of hoists raises 500-1000 lb loads 25 and 13 fpm . . .

double brakes, enclosed construction are other features

Uses: Mounted on overhead track, electric hoist comes in two models for handling loads of up to 500 and 1000 lb, respectively.

Features: One-hand rope control, double brakes, and enclosed construction are listed features. Manufacturer reports hoist has weight-overload safety factor five times rated capacity.

Description: Zip-Lift electric hoist is one of manufacturer's standard models but with one-hand rope control added. Unit



In 500 and 1000-lb capacity models

has oil bath lubrication and grease-packed motor bearings. Both 500 and 1000-lb models are available with 12 and 18' lift. Pushbutton control models will also be available.

(Developed by the Harnischfeger Corp., Dept. CP, 4400 W. National Ave., Milwaukee 46, Wis. . . . or for more information reader may simply check CP 5831 on handy form located between pages 2 and 3.)



For more information on product at left, specify CP 5832 . . . see information request blank between pages 2 - 3.

(Continued)
Second
screw
delivered
In addition
conveyer
as can be
mixer

Fig. 1 of 2

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(Continued from page 83)

Second bucket conveyor lifts pulverized coal from screw conveyor to another screw conveyor which delivers it in measured amounts to mixing tank. In addition to transporting pulverized coal, second conveying unit delivers only enough of material as can be readily mixed with other ingredients in mixer vat.

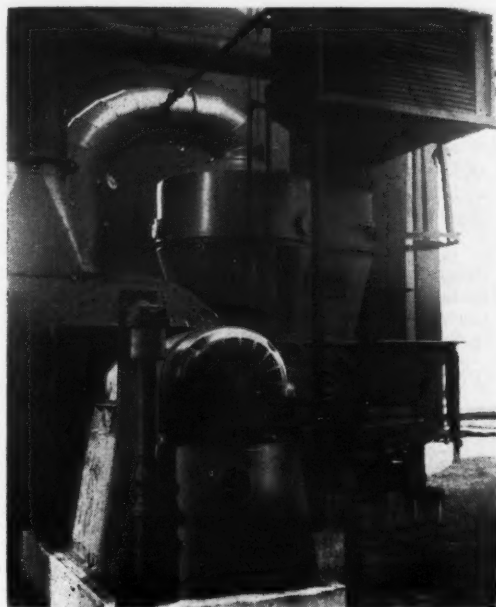


Fig 4—Pulverizer receives coal by gravity from top of silo before material is conveyed pneumatically into weigh hopper

Handling of talc is almost identical, except that since the talc is already pulverized upon arrival, it goes from its silo directly to weigh hopper. In receiving the talc from trucks, a canvas boot connects truck's outlet and delivery to a screw conveyor having a capacity of 15 tons/hr.

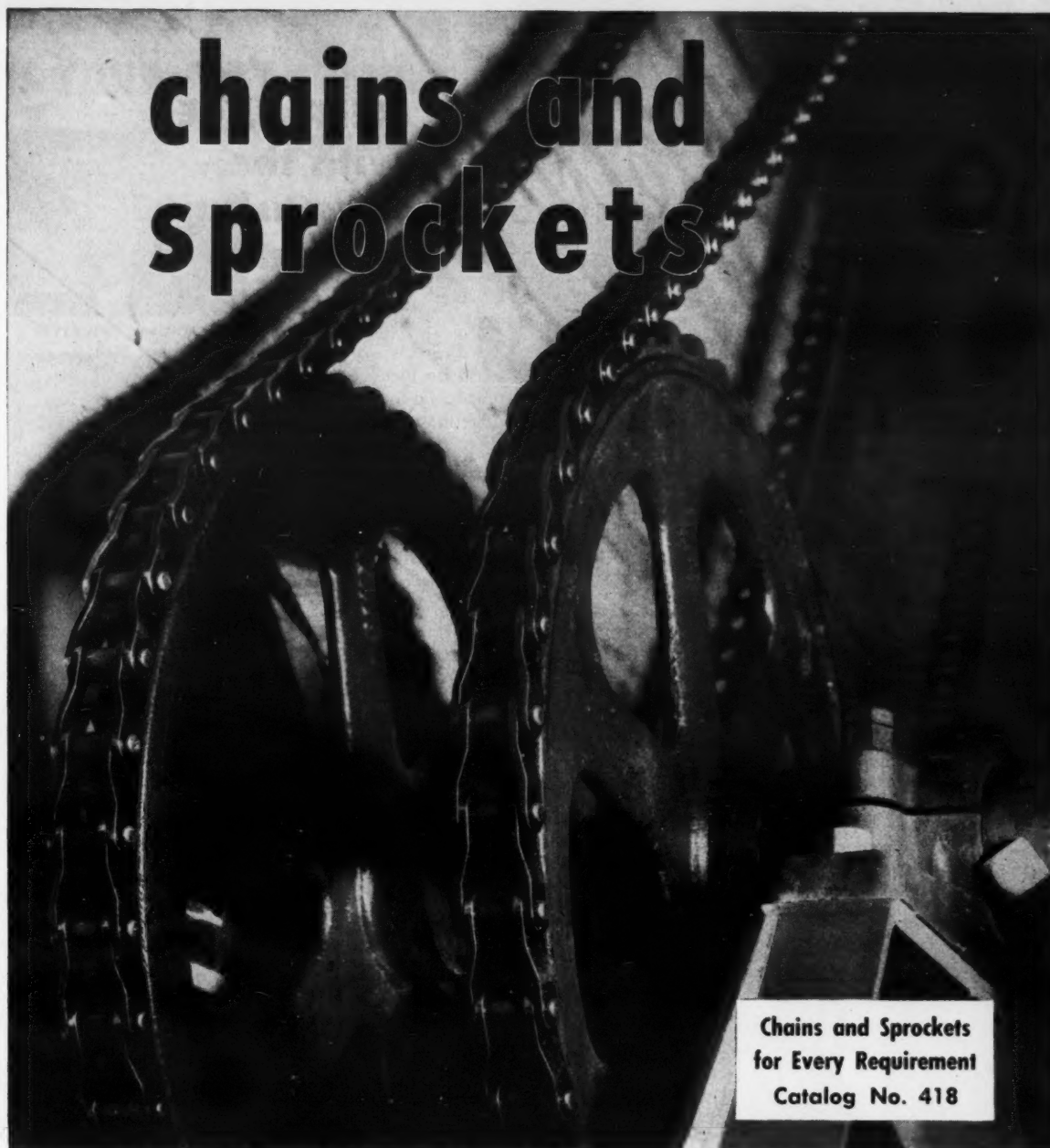
As a precaution against overloading screw conveyor, a rotary valve control, synchronized with conveyor, is installed between boot and receiving port. This also assures uniform delivery.

Results: Delivery of dry materials is now handled by one man using a pushbutton system. Dust in process is reduced to a negligible amount through use of totally-enclosed conveyors and silo dust collectors. Labor costs have been cut; maintenance has been reduced.

(Information supplied through courtesy of Koppers Company, Inc., Koppers Bldg., Pittsburgh 19, Pa.)

Using controlled volume pumps? You'll be interested in the faster method of estimating pump capacity, page 162.

chains and sprockets



Chains and Sprockets
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Catalog No. 418



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When inquiring check CP 5833 on handy form, pgs. 2-3

Marietta

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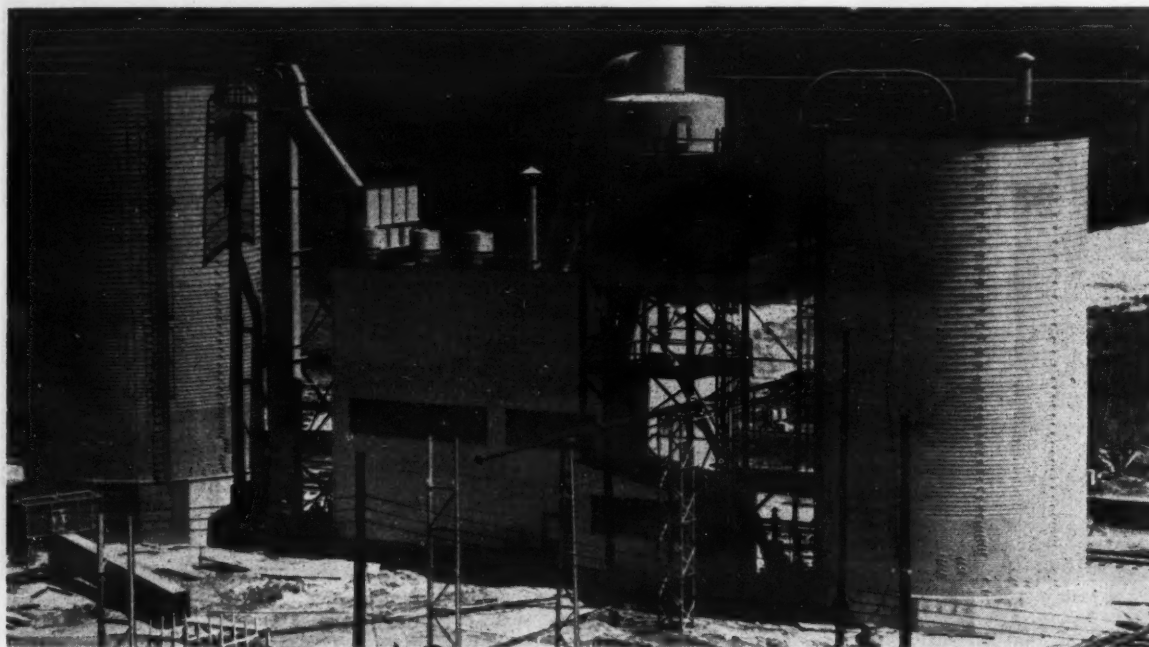
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When inquiring check CP 5834 on handy form, pgs. 2-3

MATERIAL HANDLING

Conveyor is especially designed for small size containers, lightweight units . . .

takes 1, 2, or 3" belts on 5" frame; 8" model accommodates 4, 5, or 6" widths

Uses: For belt conveying of small dimension, light-weight containers.

Features: Narrow belt conveyor is available with a 5" frame which takes 1, 2, or 3" belts. Slightly larger 8" frame accommodates belts of 4, 5, or 6" widths.

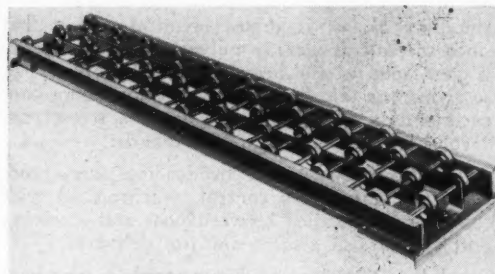
Description: Starting at 5', model may be had in any length of 5' increments. Unit is constructed of standard parts, may be readily lengthened if necessary. Conveyor may be obtained with or without side leaves or guard rails and in four fixed belt speeds.

(Narrow belt conveyor is manufactured by the Island Equipment Corp., Dept. CP, 27-01 Bridge Plaza North, Long Island City 1, N. Y. . . or for more information check CP 5835 on handy form, pages 2 and 3.)

Light, sturdy and rust-resistant are qualities of conveyor made of aluminum . . .

weight is less than half that of comparable steel units, frames are reinforced

Uses: Available in both wheel and roller sections, aluminum units can be used with existing steel conveyors.



Weights less than steel, is rust-resistant

Features: Light weight, rugged construction, easy handling and rust resistance are some of the advantages listed for portable, aluminum conveyor sections, reported to weigh less than half comparable steel ones of the same design and capacity.

Description: Frames of conveyors are special channel and bar aluminum, reinforced with end plates and tubular cross-braces. Inner bearing races and ball bearings are of hardened steel, protected by a dust shield and packed with lubricant. Both ends of each section are identical.

Sections are available in standard 5 to 10' straight lengths and in three widths. Overall widths are

MATERIAL HANDLING

12, 15, and 18 inches. Portable curve sections are reversible for right or left hand turns, in the same widths and in 30, 45, 60 and 90° turns. Each turn section is equipped with outer guard rail and center supporting leg.

Quick, adjustable stands can be furnished. Four standard models provide adjustable heights from 12 to 48", although special models are also available, adjusting from 36 to 96".

(Developed by The E. W. Buschman Co., Dept. CP, Spring Grove and Clifton Aves., Cincinnati 32, Ohio . . . or for more information reader may simply check CP 5836 on handy form, pages 2 and 3.)

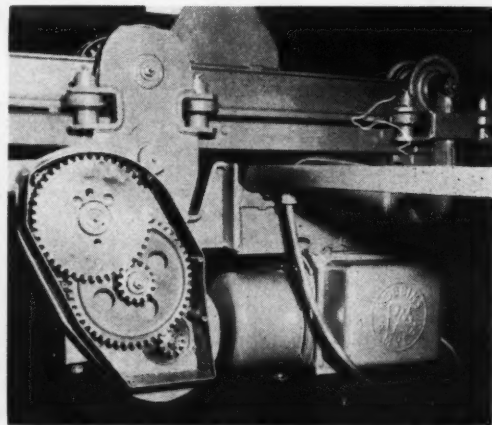
Motor-driven tramrail trolley has wide range of travel speeds . . .

can be provided with any of 18 travel speeds by changing two or four gears

Uses: In systems where tramrail conveyors are used at either constant or variable speeds.

Features: Choice of 1800, 1200, and 900 rpm high starting torque motors coupled with 18 possible gear reductions.

Description: Trolleys are designed to operate with any common industrial voltage and are controlled by simple pendant, automatic dispatch remote control, or cab attached to trolley for operator. Steel drive wheels roll on top of track. To take rolling load close to the rail web and away



Electric-powered trolley has 18 possible gear reductions

from track edge, wheels are crowned. Four guide rollers mounted on trolley frame position its direction of travel. Range is from 56 to 600 fpm in either single or variable speeds.

(Trolley is product of Forker Corp., Dept. CP, 2019 Random Rd., Cleveland, Ohio . . . or for more information reader may simply check CP 5837 on handy form, conveniently located between pages 2 and 3.)

IS YOUR JOB

HARD TO HANDLE?

LOOK AT WHAT ONE HYSTER JOB-ATTACHMENT CAN DO



REVOLVING LOAD-GRAB



SCOOP, FOR LOOSE MATERIALS



PULPWOOD BOOM



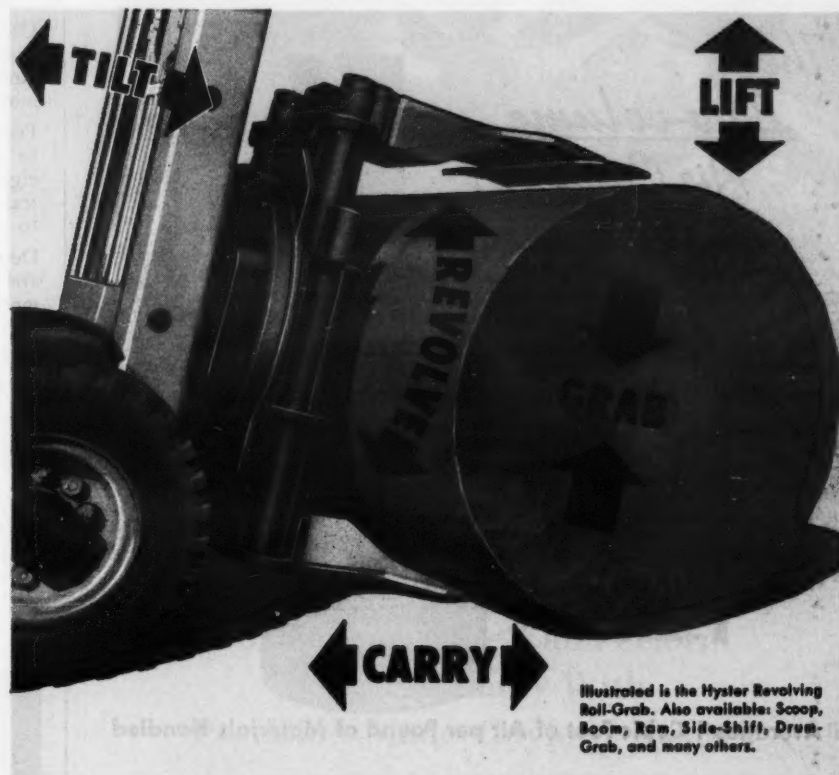
RAM, FOR ROLL SHAPES



LOAD-GRAB FOR CRATES, BOXES



BOOM, AS MOBILE CRANE



Illustrated is the Hyster Revolving Roll-Grab. Also available: Scoop, Boom, Ram, Side-Shift, Drum-Grab, and many others.

...over 100 HYSTER® JOB-ATTACHMENTS offer NEW WAYS to save money by better materials handling

"You can handle just about *anything* with a Hyster Lift Truck and the right job-attachment," say experienced operators. Hyster records, covering practically every industry, bear this out. They show that the right Job-Attachment greatly speeds handling, often makes possible greater use of lift trucks...thus realizing more of the basic advantages of lift truck operation. In many cases, Hyster Job-Attachments eliminate need for pallets, *saving even more money!*

The Load-Grab® is only *one* of many basic lift truck Job-Attachments devel-

oped and pioneered by Hyster. However you are now handling your materials at receiving, in-process, storage, or shipping — inside or outside — the proper Hyster Job-Attachment can reduce your handling costs *still further!* Your Hyster Dealer will be glad to show you how. Every one should have Hyster Attachments Catalogs 1266 and 1219. Write:

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When inquiring check CP 5838 on handy form, pgs. 2-3

Robinson

Air Activated

Conveyor

The Low-volume Air Conveyor

Heart of the Robinson Air-Activated Conveyor System... the Activator which so "fluidizes" the charge, enabling it to be handled with low volumes of air.



Averages 1 Cubic Foot of Air per Pound of Materials Handled

Right here is one reason — and a stand-out reason — why the Robinson Air-Activated Conveyor is so economical in handling bulk dry-pulverized and fine-granular materials. Compressed air costs money so, if you can hold air costs down, as with the Robinson, you keep handling costs down. And no other power is necessary to operate a Robinson System.

The reason why the Robinson System can operate with such low air volume is due to the fluidized nature of the charge when transported through the pipes. Pressure alone will not suffice. It requires this Robinson Air-Activation or fluidizing effect. Material "flows" rather than blasts through.

Many Robinson Systems are in service handling a variety of products and in some cases are transporting them several thousand feet. This system may be just what you need for handling those dry, bulk materials in your plant. It has several outstanding features which we'll be glad to discuss at your convenience.

ROBINSON

Air Activated

A Division of
Morse Boulger Destructor Co.

CONVEYOR SYSTEMS

211-V EAST 42nd ST. • NEW YORK 17, N. Y.

Representatives in Principal Cities

When inquiring check CP 5839 on handy form, pgs. 2-3

MATERIAL HANDLING

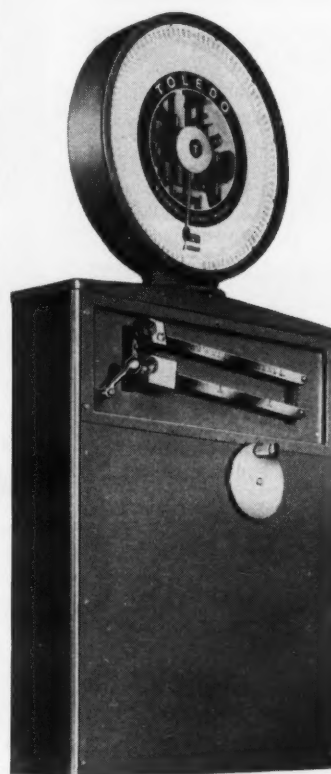
Indicating heads on scales can be set for reading from 8 angles...

or heads can be swiveled fully through a 360° circle

Uses: Manufacturer's line includes models of industrial scales from bench scales to heavy duty motor truck applications.

Features: Indicating heads can be installed to face in one of eight different directions; or scales can be ordered with heads to swivel fully through 360°.

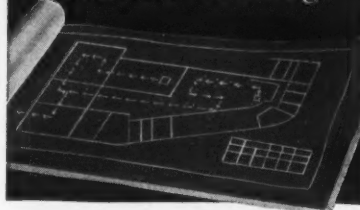
Description: One-piece sectors are featured in double-pendulum mechanism, constructed for precision and strength, which eliminates hand adjustments nec-



Indicating head can be installed to face any one of eight directions

essary in the older assembly of several components. Improvements on portable model include a large platform (18% more area); bench scale models are 31 per cent larger, and in both cases overall dimensions of the scale base have been reduced by a considerable amount.

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One Midwest manufacturer saved \$90,000 on equipment cost alone because he called in a Weld-Bilt engineer FIRST, before deciding on expensive special-design units recommended to solve a difficult handling problem. Our engineer, experienced in cost-saving shortcuts, showed how simple adaptation of more standard equipment could do the job even better.

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Call in the WELD-BILT Materials Handling Engineer for an economical solution to your problem today. You'll probably save money.

WEST BEND EQUIPMENT CORP.

322 Water St., West Bend, Wis.

MATERIALS HANDLING ENGINEERS

Portable Elevators • Pallet Trucks • Single Stroke Lift Trucks • Two-Wheel Trucks • Platform Trucks • Skid Platforms.

When inquiring check CP 5840 on handy form, pgs. 2-3

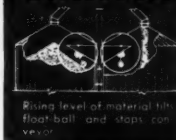
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SA TELLEVEL Automatic bin-level control

FOR BINS, HOPPERS, TANKS, ETC.

Provides continuous, dependable level control for bulk materials or liquids. Mount Tellevels near top and bottom or at various levels in bins, tanks, etc. Rising or falling material moves light float-ball stops or starts conveyor, elevator or pump. Normal duty, heavy duty and explosion-proof models.



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ESSING



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FLEXIBLE
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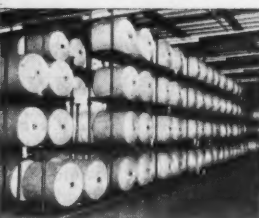


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THE PALTIER CORP.

1713 Kentucky St., Michigan City, Ind.

When inquiring check CP 5842 on handy form, pgs. 2-3



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This illustrated folder describes the complete line of Ballymore ladders that are saving time and money and increasing capacity of storage space in business and industry. Send for your free copy today.

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When inquiring check CP 5843 on handy form, pgs. 2-3

JANUARY, 1954

MATERIAL HANDLING

Heavy-capacity models now have up to nine unit weights available, in standard combinations, as compared to four in the previous line. Industrial scales are finished in gray; tare and capacity beams are stainless steel with chrome-plated brass poises.

(Development of the Toledo Scale Co., Dept. CP, Telegraph Road, Toledo 1, Ohio . . . or for more information check CP 5844 on handy form, pages 2 and 3.)

Manual, powered equipment team up in handling of materials . . .

effective combination releases fork trucks for bigger jobs

An effective combination of hand and power equipment helps to reduce costs and provide optimum materials handling efficiency. When properly applied, the less expensive hand trucks can be used to release fork trucks for the longer transportation jobs and for stacking.

Where materials handling equipment manufacturers have designed their hand trucks with the same capacities of their powered fork trucks, hand trucks can be quite valuable for order picking, assembling of loads in a central spot, or for loading and unloading of highway trucks.

One case where this "double application" is practiced is at a large bottling plant where a Spacemaster Model "J" electric fork truck transports pallets to the hydraulic dock lift and the hand lift truck takes over for truck loading. Both units can handle up to 2000-lb loads on standard pallets and both trucks can operate in the most confined areas due to the short headroom height.

With the hydraulic pallet truck no extra room is required for pumping of the handle — by use of a foot lift the truck operates wherever it can be placed.

(The electric fork truck and the hydraulic pallet truck are products of Lewis-Shepard, Dept. CP, Watertown, Mass. . . . or for more information reader may simply check CP 5845 on handy form, pages 2 and 3.)



Your Packing Line Can Perform More Profitably With Precision-Made Gaylord Boxes

The more efficient you make your packing operations, the more costly every interruption becomes. That's why every Gaylord box is precision-made to exact specifications . . . to assure smooth, continuous operation without jamming or sticking. Very often, the money saved by this increased efficiency in packing more than pays for any difference in original box cost.

Whatever the size, shape or type of container you need, if it's Gaylord-made you can be sure that it will help develop top efficiency in your packing system. For information and cooperation, phone your nearby Gaylord office. You'll find it listed in the phone book.

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CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS • KRAFT BAGS AND SACKS • KRAFT PAPER AND SPECIALTIES



Modern transportation demands the ultimate in materials handling. This Towmotor LT-60 is one of a fleet owned by the Flying Tiger Line.

Get up and go...

Towmotor has the "get up and go" you want to speed materials through each step of receiving, storage and production right into the carriers—even when you're short-handed! This "one-man-gang" lifts, carries, lowers and positions any load that can be *banded*.

If you like to break records, if your boss is economy-minded, you'll want all the new Towmotor features, including Towmotor Towmotor Torque Drive, Power Steering, and "Cushioned Power" Diesels. Send for free booklet, "What Makes It Tick?" TOWMOTOR CORPORATION, Div. 2301, 1226 East 152nd Street, Cleveland 10, Ohio.

TOWMOTOR
THE ONE-MAN-GANG

FORK LIFT TRUCKS and TRACTORS

Since 1919

TOWMOTOR ENGINEERED FOR QUALITY PERFORMANCE

When inquiring check CP 5846 on handy form, pgs. 2-3

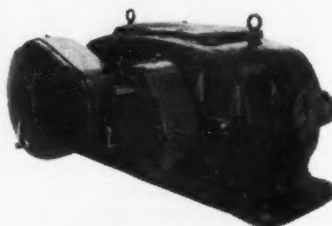
MATERIAL HANDLING

Offer two modifications of 20-25 hp drive units for variable speed

Uses: For control and infinite variation of machine or conveyor speeds, for synchronization and timing of operations, and for metering and proportioning. Unit is also designed for rapid speed changing under full load by manual control, automatic control, or remote control.

Features: Power is transmitted positively and without slip by means of a drive chain. Two types of the unit are available for 20 to 25 hp applications.

Description: In addition to basic H-6 PIV of 25 hp capacity, manufacturer can now supply an HG-6 drive, furnished with either a single reduction input or single



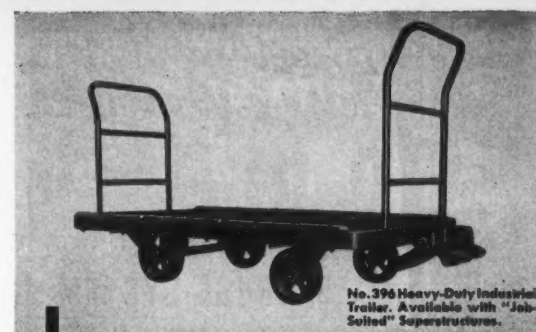
For 20-25 hp applications

reduction output helical gear attachment, or an HGG-6 drive furnished with both these types of inputs or outputs.

Input gear reductions are available from 1.93:1 min to 5.82:1 max, with output gear reductions from 1:1 to 6.33:1. Speed increasing gear sets are also available. Drive chains for transmitting power have self-forming metal teeth that engage with radial grooves in two pairs of cone-shaped wheels. Ratio is changed by altering the effective diameter of the wheels.

Drive is fully enclosed, constructed entirely of metal. All moving parts are splash lubricated from a common reservoir. Drive is unaffected by high or low temp, humidity, abrasive dust or explosive vapor conditions.

(PIV variable speed drives are manufactured by the Link-Belt Co., Dept. CP, 307 N. Michigan Ave., Chicago 1, Ill. . . . or for more information check CP 5847 on handy form, pages 2 and 3.)



No. 396 Heavy-Duty Industrial Trailer. Available with "Job-Soiled" Superstructures.

For Tractor Trailer Operation 2-TON HEAVY-DUTY INDUSTRIAL TRAILER

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When inquiring check CP 5848 on handy form, pgs. 2-3



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When inquiring check CP 5849 on handy form, pgs. 2-3

Moves heat exchanger bundles without touching tubing . . .

broad, flat bearing surface eliminates use of yoke hitch

Uses: For handling heat exchanger tube bundles without crushing delicate tubing.

Features: Sling is equipped with handle which allows it to be used in either a basket hitch (giving greater strength) or choke hitch (giving greater gripping power.)

Description: Woven wire construction consists of series of spiral wire loops joined together across its body. Loop permits sling to bend tightly



Sling grips fins of heat exchanger without damaging tubing

around small radius loads and assure tight gripping. Flat, broad body of sling has a flat bearing surface that gives greater load stability.

(Sling is produced by Cambridge Wire Cloth Co., Dept. CP, Cambridge, Maryland . . . or for more information check CP 5850, pgs. 2 and 3.)

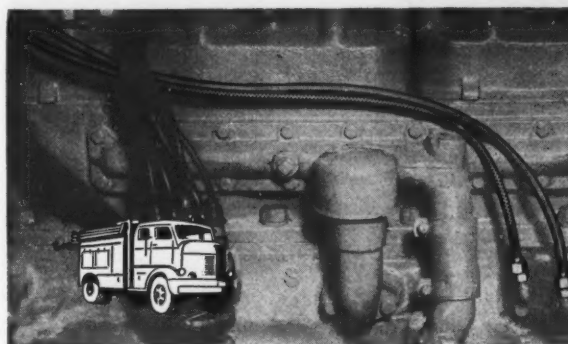
Lift truck with revolving head may be used for dumping

Revolving head attachment adapted to manufacturer's standard electric straddle trucks is illustrated and described in two bulletins. One bulletin illustrates attachment for 360° rotation to right or left, which permits dumping tote boxes or skid bins in close quarters and working in 6' aisles. An electric motor with gear reducer powers rotating plate with a chain drive.

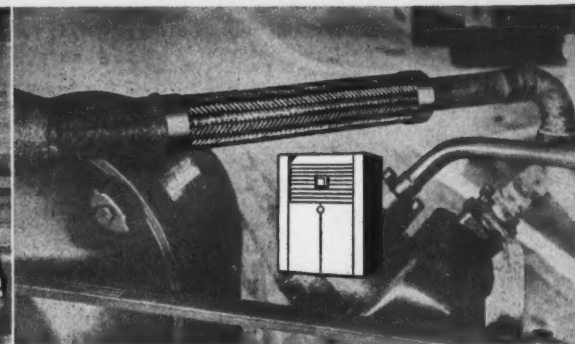
Second bulletin gives specifications for and pictures electric truck models on which attachment can be furnished.

Buls 732-Y and 703 are available from The Raymond Corp., Dept. CP, 63109 Madison St., Greene, N. Y. When inquiring specify CP 5851 on handy form, pages 2 and 3.

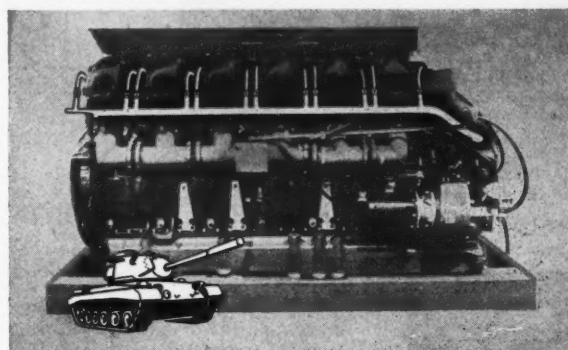
These 4 may end your design worries, too



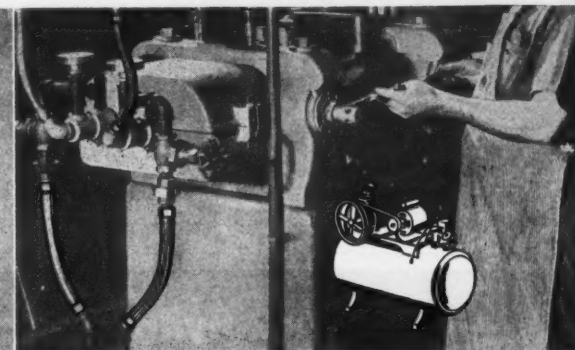
END FUEL LINE FAILURE. Four Wheel Drive's famous trucks stand up to roughest service. So do their Titeflex® oil and fuel lines. Automotive engineers specify Titeflex metal hose because it resists wear, vibration and corrosion —won't crack, bake or deteriorate under high engine temperatures.



ELIMINATE VIBRATION. To end vibration and prevent leaks around fittings, Uniflex seamless metal hose is installed between circulator coils and motor of GE's packaged air-conditioning unit. Made by Titeflex, Inc., Uniflex withstands critical stress and strain—is inherently leakproof.



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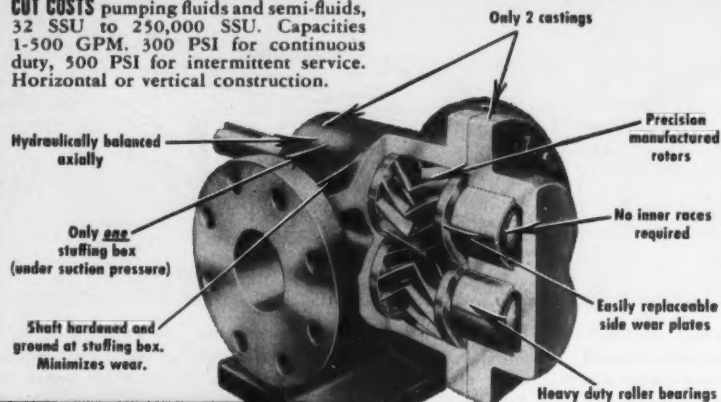
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When inquiring check CP 5852 on handy form, pgs. 2-3

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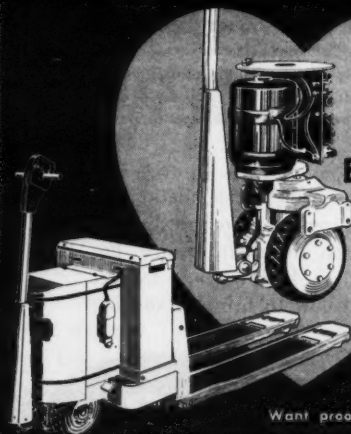
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When inquiring check CP 5853 on handy form, pgs. 2-3

Heart of the HydroElectric

THE DYNA-DUAL POWER UNIT

EXCLUSIVE



This sturdy Dyna-Dual Power Unit out performs all others for ease of operation—dependability—lowest maintenance cost and economy of power. HydroElectrics will keep rolling and moving your materials at lower costs than any truck in its class.

Want proof? Complete facts and data on request.

Note: The Dyna-Dual Power Unit is interchangeable on all models.



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INCORPORATED

2423-31 SPRING GROVE AVE.
CINCINNATI 14, OHIO



There is a model for every purpose to handle any kind of material

When inquiring check CP 5854 on handy form, pgs. 2-3

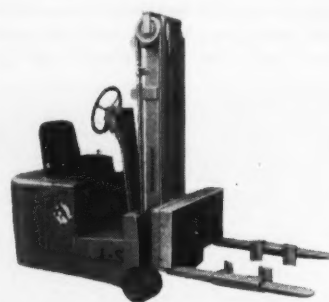
MATERIAL HANDLING

Drums, barrels, handled with clamping forks of truck

Uses: As attachment on electric fork trucks for handling barrels, drums, and similar objects.

Features: Switching over to conventional pallet handling can be made without adjustments of any kind.

Description: Hydraulically adjustable clamping forks can be used on any of manufacturer's 1000-4000 lb capacity fork trucks. If barrels or drums have adequate



Handles barrels or drums with ease

side-wall strength, it is possible to clamp them without using clamping pads. With slip-on pads, pressure is distributed enough to prevent crushing fiber drums or wooden barrels.

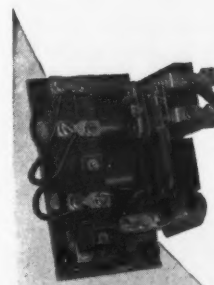
(Attachment is product of Lewis-Shepard, Dept. CP, Watertown, Mass. . . or for more information check CP 5855 on handy form, pages 2 and 3.)

Gives facts about dockboards

Five-page bulletin presents facts on magnesium dockboards. Used to bridge gap between loading docks and rail cars and highway trailers, dockboards vary in compliance with specific load and space factors. Bulletin examines these factors and gives suggestions on installing the proper type of equipment.

"Facts about Dockboards" is issued by Magnesium Co. of America, Dept. CP, East Chicago 19, Ind. When inquiring reader may simply specify CP 5856 on handy form, located between pages 2 and 3.

All Electric Floatless... LIQUID LEVEL CONTROLS



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Control variations in levels from 1/4" upward. Remote control if desired — any distance. Controls unaffected by acids, caustics, pressures or temperatures.

Since 1933 B/W Controls have provided positive, dependable, economical liquid level control. No floats! No vacuum tubes! No moving parts in liquid.

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CORPORATION**

Birmingham, Michigan
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When inquiring check CP 5857 on handy form, pgs. 2-3

Pump liquids, gases, solids in solution

Just place connecting
tubes in

**NEW,
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**Sigmamotor
Pump!**



• Wavelike
action of steel
fingers forces
liquid through the

tubing. Material in tubing never touches pump. Stops contamination and corrosion. Excellent for handling of corrosive solution.

Smaller unit with capacities to 30 gallons per hour. **\$195⁰⁰**
\$55⁰⁰

SIGMAMOTOR Inc.

18 North Main Street • Middleport, N. Y.

When inquiring check CP 5858 on handy form, pgs. 2-3

MATERIAL HANDLING

Brings lab accuracy to shop in weighing bulky goods . . .

crane scale accurate to within 0.2 per cent of its capacity

Uses: For weighing bulky material where hoist or crane equipment is ordinarily employed.

Features: Large top U-bolt and 360° swivel hook allows scale to fit any hoist or crane application while adding only 19 1/8" to the required



Scale tilts 15° for easy reading

headroom. Dial case is tilted 15° downward making it possible to read.

Description: One-piece housing of scale offers protection against the usual handling of industrial equipment. Unbreakable plastic crystal protects dial from impact, chemicals, and other dangers. There are no levers, balance weights, knife-edges, or delicate bearings. Manufacturer guarantees scale to be accurate within 0.2% of capacity. When not used scale is stored on own stand.

(Scale is a product of A. H. Emery Co., Dept. CP, New Canaan, Conn. . . or for more information check CP 5859 on handy form, pages 2 and 3.)

Case histories of pneumatic conveyors described in literature

Sixteen-page bulletin with illustrations and detailed schematic drawings give several case histories of industrial uses of pneumatic conveyors in large-scale handling of bulk materials. Features of manufacturer's compressors are also included.

Bul FK-26 is issued by the Fuller Co., Dept. CP, Catasauqua, Pa. When inquiring specify CP 5860 on handy form, pages 2 and 3.



Paint drying time of tile board is reduced 50 per cent by the installation of a Link-Belt 468 rivetless chain conveyor for propelling tiered racks through drying oven.

What is the right chain for your drive or conveying job?

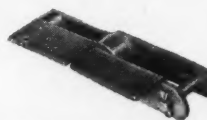
Typical chains from the complete LINK-BELT line



Class SS bushed roller chain with offset sidebars—for heavy drive service at moderate speeds.



Class C combination chain—popular, durable, low cost design for elevators, conveyors.



Class SS bushed roller chain with straight sidebars—for practically any conveying or elevating service.



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WHETHER it's a high-hp, heavy-impact drive or relatively slow-speed conveying service—you can get the *one* chain that best meets your needs from Link-Belt's complete chain line. Our engineers will be glad to work with you—help you select the right chain for your requirements. And you can be sure that any Link-Belt chain you buy is quality-built for longer life.

LINK-BELT

CHAINS AND SPROCKETS

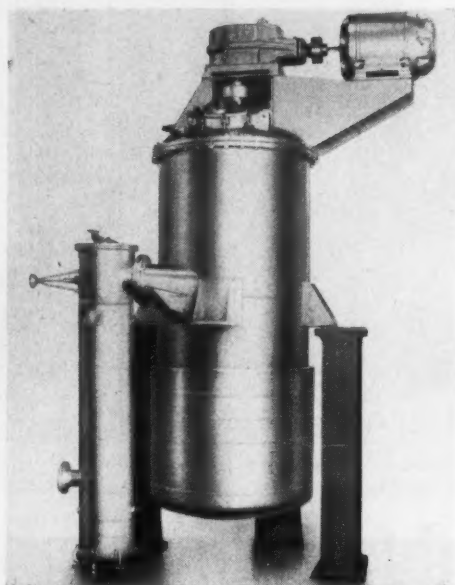
LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities.

19,209-C

When inquiring check CP 5861 on handy form, pgs. 2-3

BUFLOVAK

can help you solve
processing problems —
at a PROFIT



A special BUFLOVAK Evaporator-Still which combines two processes into one.

BUFLOVAK has helped another nationally-known manufacturer produce a better product at lower cost by combining two processes into one. That, of course, means greater profits!

A valuable, dilute, heat-sensitive solution is carried to high concentration in a single, compact unit. Ordinarily a two stage process would be required.

Special equipment was engineered for the job. A low-temperature, sanitary evaporator steam-chest and a high vacuum processing kettle equipped with an agitator and selectable heating surfaces, were combined into a single, integral unit.

Through the combined facilities of our Research and Testing Laboratories, coupled with extensive field experience, BUFLOVAK Engineers design processing equipment for the most profitable results.

BUFLOVAK Catalogs have a wealth of valuable information on drying, evaporation and processing. A request on your company letterhead will bring copies to you.

BLAW-KNOX COMPANY

BUFLOVAK EQUIPMENT DIVISION

1645 Fillmore Ave.

Buffalo 11, N.Y.



Recent Books



ELSEVIER'S ENCYCLOPAEDIA OF ORGANIC CHEMISTRY VOLUME XII B.

Reviewed by Howard L. Pilat

Chemical Division

Celanese Corporation of America

This volume, edited by F. Radt, is the latest in the ambitious undertaking designed by Elsevier to survey all organic compounds completely.

The pre-eminence of the Beilstein compendium as the fundamental source book of organic chemical literature is undisputable, but the Elsevier volumes which have appeared offer the definite advantage of being relatively close to present day research. The original literature (over 650 journals) dealing with the formation of the compounds treated in this volume has been consulted up to 1953, while all other phases are reviewed through 1944. The work is in English and the generous spacings and large type will be welcomed by the literature researcher. The editors have realized that the usefulness and success of this type of publication rests ultimately in the thoroughness of their compilations and in the ability of the reader to locate existing information. In these aims, the coverage of the literature appears to have been exhaustive and the methods of classification streamlined and simplified.

The editors have separated the entire field of organic chemistry into three series: aliphatics, carbocyclics, and heterocyclics. The volumes published to date have all been in the carbocyclic series. Treated in this volume are carboxylic acids containing the naphthalene skeleton, wherein one or more carboxyl groups are attached to a carbon atom on a side chain. These include the alkyl and isocyclic side chain, lactone, halonitro, hydroxylamino, hydrazino, hydroxyl, and oxo derivatives in both the carboxylic side chain and in the ring. Methods of formation, reactions, biological properties, and derivatives (with their methods of preparation, reactions, etc) as reported in the scientific and patent literature, are summarized and completely referenced. Included in the methods of formation are occurrence in nature and in technical products, synthesis from systems with fewer carbon atoms, preparations by rearrangement, and also by degradation from more complicated systems. Complete alphabetical and formula indices are included with additional summaries of collective groupings of the modified naphthalene nucleus.

Possession of this volume is of course a requisite for scientific libraries, and researchers in the biological

and pharmaceutical fields will find it to be particularly valuable.

To obtain "Elsevier's Encyclopaedia of Organic Chemistry" remit \$66 direct to Elsevier Press, Inc., Dept. CP, 402 Lovett Blvd., Houston, Texas. When inquiring specify 5863 on handy form located between pages 2 and 3.

THE FURANS

Reviewed by Rex Montgomery

Research Associate

Department of Agriculture

University of Minnesota

"The Furans" a book of 824 pages, excluding the index, by A. P. Dunlop and F. N. Peters, is the 119th in the ACS Monograph Series and is worthy to take its place in permanent chemical literature. The reviewer considers it a fitting tribute to those chemists who accepted and finally resolved the challenge of the often elusive properties of furfural. That the authors were among this group of scientists is obvious from the understanding which they have shown for the subject.

The book is divided into two parts, the first dealing with the chemistry of the furans and the second with the industrial applications of furfural and its derivatives. Chemical aspects of the review are treated from an electronic standpoint, without making difficult reading for those scientists not fully versed in these theories. Composition of the book is such that reading into any depth of the subject is possible, specialized information, such as the preparation and properties of individual compounds, being separated from the main body of the text.

In addition, compilation of physical properties of the furan derivatives in tabular form, the critical treatment of a confusing early literature, the method of preparation of many individual compounds, the discussion of industrial applications with possible glimpses into the future and the collection of furan resin patents in an appendix make the book invaluable to the industrial and fundamental chemist as well as to the advanced student. Only minor criticisms of nomenclature and adequacy of the index (42 pages) were noted.

To obtain "The Furans" remit \$18 direct to Reinhold Publishing Corp., Dept. CP, 330 West 42nd St., New York 36, New York. When inquiring specify CP 5864 on handy form, pages 2 and 3.

When inquiring check CP 5862 on handy form, pgs. 2-3

CHEMISTRY OF CARBON COMPOUNDS VOL. IIA, ALICYCLIC COMPOUNDS

Reviewed by Dr. Harry S. Mosher

Department of Chemistry
Stanford University

This is the first part of the second volume of the comprehensive five-volume treatise on the chemistry of carbon compounds which is being written by a group of English chemists and being edited by Dr. E. H. Rodd. The series is a modern English version of the older Richter.

Volume IIA covers alicyclic compounds in general, but does not treat the special subjects of terpenes and sterols which will comprise the subject matter of Volume IIB. The three contributors are R. G. R. Bacon, L. Combrie, and R. A. Raphael. Of the 436 pages of text, Dr. Raphael has written 345 and thus the book is primarily a result of Dr. Raphael's efforts.

The material is organized into a general introductory chapter followed by individual chapters on cyclopropanes, cyclobutanes, cyclopentanes, cyclohexanes, larger alicyclic ring compounds, polynuclear alicyclic compounds, bridged-ring systems and a special section on the carotenoids and on the subject of natural and synthetic rubber and derived materials.

The book is very well written; the style is of necessity quite condensed and approaches that of an organized encyclopedia of selected chemical compounds. The treatment stays very close to the factual representation or generalization except in the introductory chapter and the chapters on carotenoids and rubber. The text is filled with abundant references to the original literature which is covered through 1951. This results in an up-to-date reference text in the field of alicyclic compounds which should be available to every student and research worker in the field.

To obtain "Chemistry of Carbon Compounds Vol. IIA, Alicyclic Compounds" remit \$12.50 direct to Elsevier Press, Inc., Dept. CP, 402 Lovett Blvd., Houston, Texas. When inquiring specify CP 5865 on handy form, pages 2 and 3.

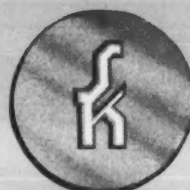
Supplemental information on paddle flocculation

Six single-page data sheets form a technical supplement which describes slow-mix paddle flocculation equipment for chemical mixing, coagulation and flocculation in treatment of water, sewage.

Supplement shows a typical installation and explains how manufacturer's paddle flocculation unit has been designed to efficiently carry out the slow mixing and flocculation functions required in coagulation process. It tells how inherent design features have been utilized to allow for flexibility in operation, ease of installation, and simplified maintenance.

Technical Supplement "PF" is issued by The American Well Works, Dept. CP, Aurora, Ill. When inquiring specify CP 5866, pgs. 2 & 3.

TRADE PAPER EDITION
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Why Should You Come To SK For Standard Or Special Heat Transfer Equipment?

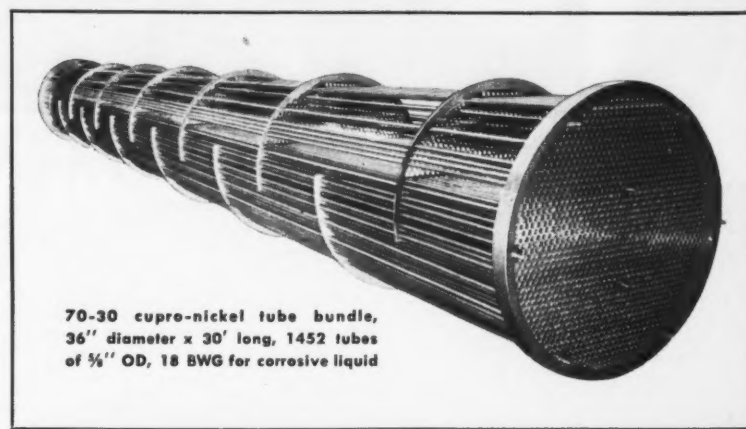
Have you, or are you likely to have, a problem in Heat Transfer involving special heavy duty equipment? Does your problem involve out-of-the-ordinary materials, highest precision and uniformity requirements, better than ordinary test and quality control facilities? Would you like to have technical assistance from HT specialists with wide experience?

Or do you just need a well designed, carefully built standard Heat Transfer Unit?

SK manufactures standard equipment, designs and builds special equipment for heat transfer service for pressures up to 5000 psi, temperatures to 1100° F.

And, here's why you should come to SK for such equipment—

All SK Heat Transfer Units feature: (1) close tolerances between tube OD and tube sheet hole ID; (2) polished tube ends to insure best metal to metal joint between tube OD and tube hole; (3) shell bores to exact tolerances to insure close fitting baffles for top efficiency; (4) rigid inspection of materials,



70-30 cupro-nickel tube bundle,
36" diameter x 30' long, 1452 tubes
of 3/4" OD, 18 BWG for corrosive liquid

methods, final assembly; (5) A.S.M.E. Code qualifications; and (6) electronically controlled tube expansion*. SK is particularly well equipped to solve unusual HT requirements, because . . .

SK has specialized in HT problem solving for a great many years—is set-up operationally for this.

The engineering staff is experienced—includes Chemical, Industrial, and Mechanical Engineers who understand chemical, power, processing, marine requirements, who think on the level you will require, who talk your language.

SK research facilities are set up to anticipate future requirements.

Production facilities are such that the company has been able to provide radiafin air coolers rated at 7500 hp

weighing 47,000 lbs. . . heat exchangers with special Everdur tube bundles, shells and head lining . . . 36" diameter, 30' long cupro-nickel units for cooling sodium carbonate solution for liquid rheostats . . . special units for handling hydrocarbon gases and synthetic rubber.

Quality Control and test facilities include equipment for hydrostatic, magnaflux, pneumatic, temperature shock, polariscope testing and radiographic inspection (250,000 Volt X-ray machine; Cobalt 60).

Space will not permit many other details worth noting but, if you want more information, do this: (1) write for Bulletin HT-1 which describes the type equipment we make, or (2) request a copy of Vol. 5 No. 3 Engineering News which contains an article on our problem-solving facilities.



*Tubes being expanded using electronically controlled tube rolling machine. This method provides advantages as follows: (1) every tube is expanded uniformly with no over or under expansion, (2) there is no enlargement of tube holes, (3) ligament fracture is prevented, (4) there is minimum tube elongation and tube sheet warpage is reduced, (5) tube wall stresses are reduced, (6) guess work is eliminated, ideal standards for tube joints apply.

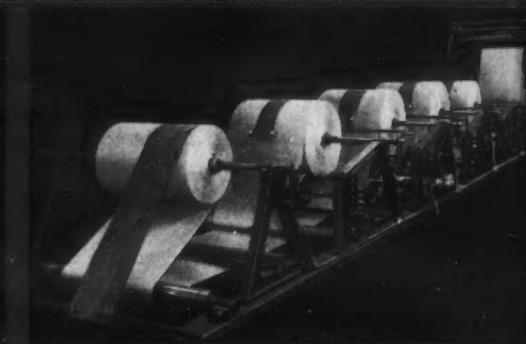
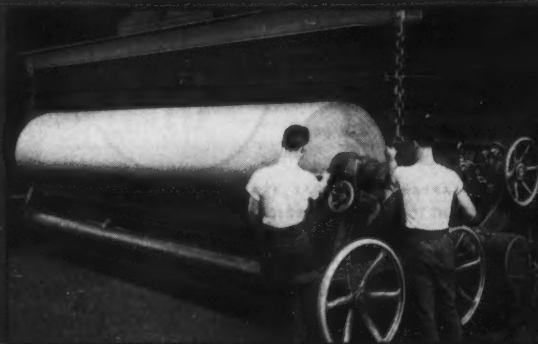
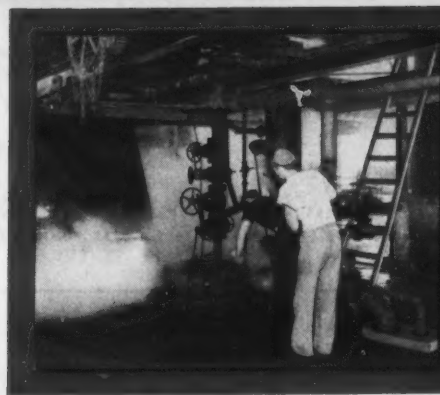
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When inquiring check CP 5867 on handy form, pgs. 2-3



packaging



Billions of packages for products from Activated Carbon to Zinc Sulphate

The simplest definition of a multiwall bag is in the trade name itself — a bag with several (multi) walls. These walls, called "plies" in the packaging industry, are made of paper. To obtain maximum strength and flexibility, the bag is made from two or more plies rather than from one ply of equal basis weight. For example, a bag with four plies of paper, in a combination of two 40 lb and two 50 lb sheets, will have greater flexibility and give service equal to or greater than that of a bag made with two 90 lb sheets, or a bag made with three 60 lb sheets. This, even though all three bags have the same total basis weight of 180 lb.

Unlike other containers, there is no "standard" multiwall bag. Each bag must be produced to meet the requirements of the user. This "custom-made" feature is necessitated by the fact that the number and physical characteristics of the plies of paper used for each type of bag are dependent on the varying weights, densities, and physical properties of the products to be packed, plus the varying conditions under which the bags will be packed, shipped, and stored.

An alphabetical list of products packed in billions of multiwalls per year runs well over the 300 mark, with new products being added constantly. For instance, in agriculture the bags handle products from alfalfa meal to yeast; in building materials, products from asphalt to stucco; in the chemical and allied fields, products from activated carbon to zinc sulphate; and so on into many other industries.

Advantages

Economy is one of the basic advantages claimed by the multiwall over other types of containers. The raw material for the bags, wood, is in relatively plentiful supply (from selectively cut, fast growing Southern Pine tree farms) and technological progress in both paper and bag making has insured the continuing low cost of multiwalls in comparison with other containers for like purposes. Other important advantages are said to accrue from multiwall construction. Among these are: less product loss, no contamination, lower filling costs and increased production, less moisture absorption and moisture loss, lower transportation costs because of light tare weight, savings in storage space, no returns required, and excellent merchandising possibilities presented by the bag's smooth, hard printing surface.

Since there is no "standard" multiwall, in designing a bag for a specific operation, the problem is how

much protection is needed and what type of construction should be used to provide that protection. The value of the product always determines the type of construction. In checking a bag after it has been designed, drop tests are employed. Past experience becomes a guide in making these drop tests, and previous bag designs are checked to determine how certain features might be used for a new product to be handled.

For testing operations, the manufacturer usually makes a few bags of the new design. If these prove satisfactory in tests, a thousand bags of the same construction are made up and tested. Finally, one-half car of the new design is checked against one-half car of the old type package.

Types and Liners

The major types of multiwall bags can be divided into two general classifications: the open mouth bag, factory closed at the bottom only, using one of the various methods of pasting or sewing; and the valve bag, factory-closed both at top and bottom, but incorporating an aperture, called a "valve", at one corner. Variations of these two general types of multiwall are numerous, and include: sewn open mouth, pasted open mouth, automatic open mouth, flat sewn tube (no gussets, i.e. no tucks or bellows), sewn valve, sewn valve tuck-in-sleeve, flat sewn valve, open corner, pasted valve, pasted valve tuck-in-sleeve and others of special design.

Liners available for these bags include those made of polyethylene and glassine. Polyethylene-lined bags prevent moisture vapor transmission and fiber contamination. A typical product packaged with this liner is calcium chloride. Where oil or grease resistance is necessary, a laminated glassine liner meets the requirements.

Photo Captions

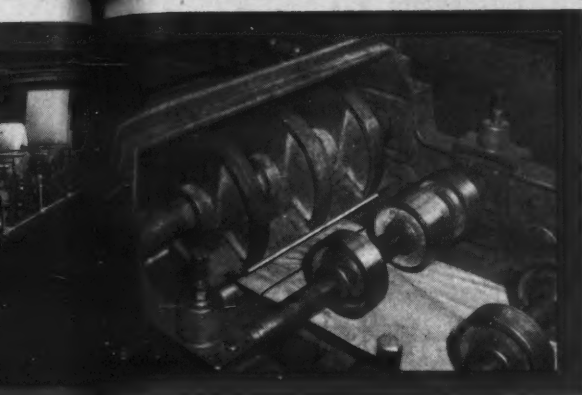
1—After trees are harvested, logs are washed, barked, and cut into small chips which are cooked for several hours under steam pressure in huge cauldrons containing alkaline chemical solution

2—Finished paper is wound on reel, then cut to width required for various bags rewound into smaller rolls

3—Rolls of paper are mounted in tandem at head of

the bag machine or "tuber". Sheets are uniformly staggered as they enter machine to permit application of paste to each individual web. One of these rolls (the outer ply) is pre-printed to customer's requirements

4—Paper is formed into a continuous tube and in subsequent operations is "tucked" and then cut (above) into individual "tube lengths"



Clay-coated liners are used for release characteristics. GRS rubber and hot asphalt are products handled by this type liner.

Laminated asphalt liners provide moisture protection, and such products as fertilizer, ammonium chloride, bichromate of soda, and sodium metasilicate are given this protection.

Other liners for specific purposes are available, as well as outside sheets to give moisture protection and non-skid qualities to the package.

Filling and Closing

Any well-conceived packaging operation involves not only a properly designed bag, but also efficient methods for filling and closing the bag. Packaging in multiwalls may be divided into two broad categories: Bulk packaging units containing 25 to 100 lb of materials; and shipping container (baler) packaging of a number of small consumer units.

One of the most important factors to consider in bag filling equipment for bulk packaging is the nature or physical characteristics of the material to be bagged. The following methods are those commonly used in the field of multiwall packaging:

A. For bulk packaging in open mouth bags:

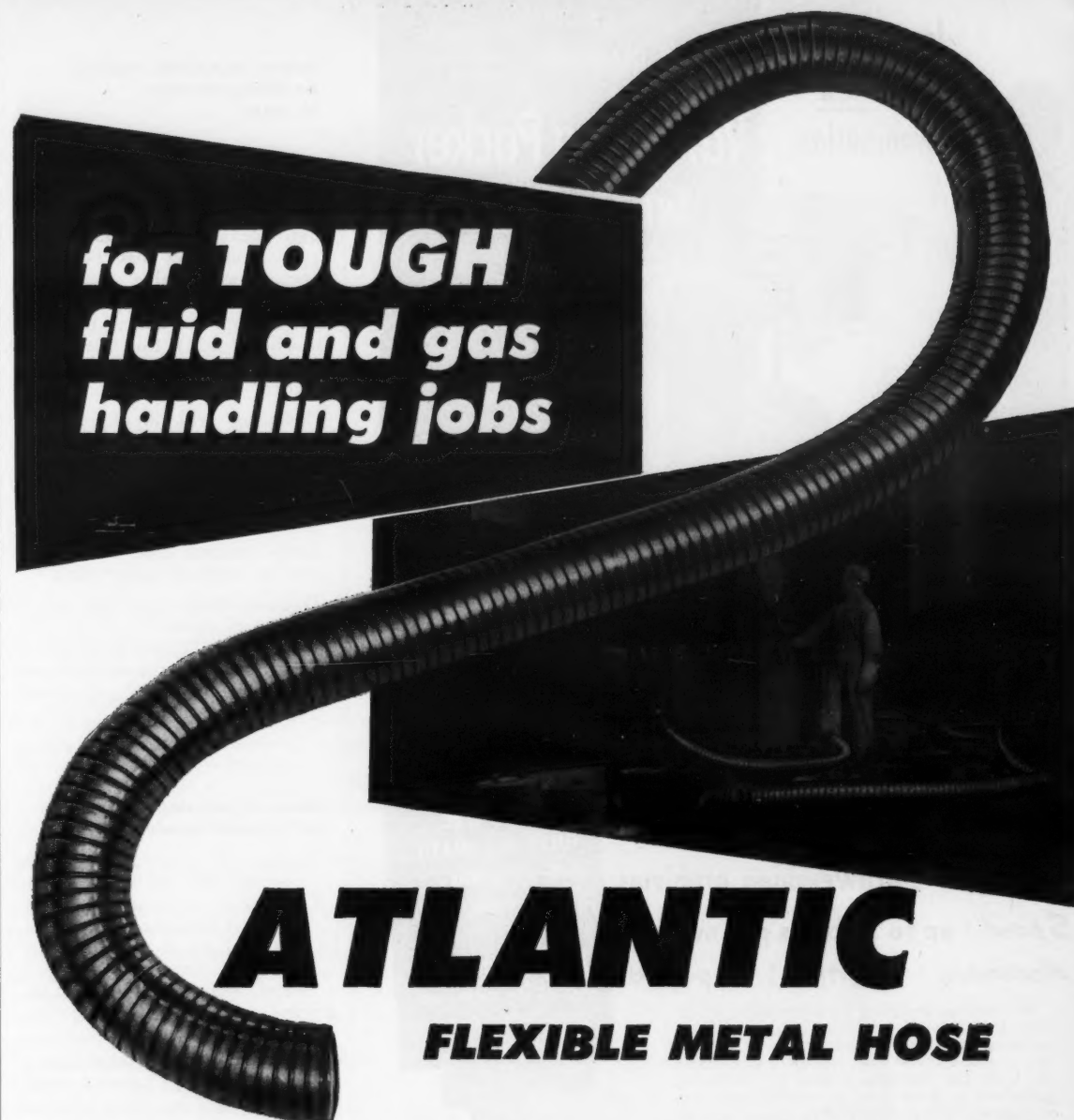
- 1—Manual spout filling and platform scale weighing, for free-flowing materials
- 2—Semi-automatic or manual gross weight scale weighing, for free-flowing materials
- 3—Automatic net pre-weighing bagging scale, for free-flowing, semi-free-flowing materials
- 4—Automatic multi-station net weighing bag filler and closer, for free-flowing materials
- 5—Vertical auger packer, for aerated, ground or semi-free flowing materials
- 6—Automatic (gross weight) bulk reducing packer, for non-free-flowing light fibrous materials such as rock wool

B. Valve bag filling machines:

- 1—Centrifugal belt packer, for free-flowing and semi-free-flowing granular materials, such as fertilizer and chemicals
- 2—Rotary impeller, for semi-free-flowing pulverized and ground materials

(Continued on page 101)

for **TOUGH**
fluid and gas
handling jobs



ATLANTIC

FLEXIBLE METAL HOSE

Conveying nitric acid for use in batch nitrations is quick death for ordinary flexible metal hose. Sulphuric acid and plating solutions are other notorious killers. When temperature and pressure extremes and adverse handling conditions are also involved, hose replacement is frequent and expensive.

That's why—for tough jobs—it's good economy to specify Atlantic flexible metal process hose. Manufactured to survive the most destructive use, it is unequalled for leak-proof qualities, flexibility, durability, strength and lightness. It performs long after ordinary hose is scrapped and returns real savings in your material and labor dollar.

Whatever your application — conveying, controlling movement and vibration, correcting misalignments, compensating for expansion and contraction — there is an Atlantic flexible metal hose that is best for it.

Available in Seamless or Interlocking construction: Steel, stainless steel, monel, bronze. 1/4"–36" I.D. inclusive with appropriate fittings.

Our engineers have developed flexible metal hose for a number of classified nuclear applications. Though these types cannot be released at present, the experience gained is available for any unusual problems you may have.

Write for Chemical and Process Industries Bulletin 200.

See our Catalogs in Sweet's Files for Product Designers and Mechanical Industries.



ATLANTIC METAL HOSE CO., INC.
106 West 64th St., New York 23, N. Y.

When inquiring check CP 5868 on handy form, pgs. 2-3

Investigate
this new
combination



BLACK DIAMOND Valve Bag Packer

AUTOMATIC
CONTROLLED
WEIGHT

AND BAG SETTLER

ACCURATE
FAST
SIMPLE
CLEAN
MODERATELY
PRICED
PERFORMANCE
GUARANTEED

BLACK PRODUCTS COMPANY

13513 S. Calumet Ave., Chicago 27, Ill., Dept. P29

MANUFACTURERS SINCE 1912

For further information, write

When inquiring check CP 5869 on handy form, pgs. 2-3

Match THAYER SCALES against your toughest bagging or batchweighing problems

Speed • up to 12 bags per minute!

Accuracy • to within 1/10 pound!

Whether batchweighing for formulations or bagging for shipment, you can speed filling and weighing operations — and get greater accuracy too — with a Thayer Fully-Automatic Net-Weighing Scale. Dry chemicals, plastics, etc. in powder, granulated or pellet form are readily handled by a unique feeding system that closely controls amount and rate of flow. Any free-flowing or flooding material may be handled with accuracy and speed. The entire weighing and discharging operation is *completely automatic*.

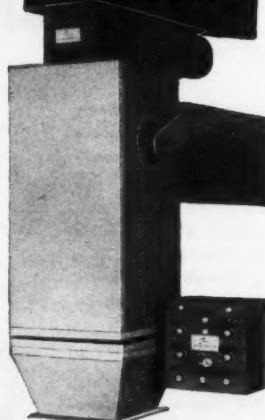
Thayer Net-Weighing Scales handle charges from 1 to 500 pounds. Exclusive shockproof leverage system — without wear-vulnerable knife-edge pivots — guarantees continued accuracy. Hopper and feeding system are stainless steel for maximum protection against corrosion and contamination.

Thayer Gross-Weighing Scales are also available for filling directly into bags, drums and cartons.

Checkweighing Problems? . . . write for information on Thayer Checkweight Scales which *automatically* indicate weight of filled container and then separate off-weight units from properly filled packages! Types available for packages weighing from 1 to 200 pounds at rates up to 60 packages per minute. Latest Model 1005 automatically checkweighs bags and cartons *before* they are closed!

THAYER
FULLY AUTOMATIC
net-weighing
filling scale

MODEL 600N
Write for detailed
description today!



THAYER SCALE AND ENGINEERING CORPORATION

492 EAST WATER STREET, ROCKLAND, MASS.

Where weight is worth money . . . it pays to be sure!

When inquiring check CP 5870 on handy form, pgs. 2-3

PACKAGING

**Heavy handling avoided
by filling bottles
in cases . . .**

unit fills free-flowing liquids
automatically by vacuum

Machine for filling bottles that have been previously labeled and packed in cases has been announced as available. Said to be ideal for filling all types of free-flowing liquids (among them hydrochloric acid), this filler eliminates handling of heavy, filled bottles.

Operating with head of filler lowered into case, unit fills bottles by vacuum and is designed to return surplus liquid to an overflow container. Motor automatically stops when bottles are filled. Easily cleaned unit is available with or without supply tank.

(Liquid filling machines are a product of Eyrl Co., Dept. CP, 1539 Folsom St., San Francisco 3, Calif. . . or for more information check CP 5871 on handy form, pages 2 and 3.)

Show dispensing valve for aerosol products

Illustrated 4-page bulletin shows and describes valve for aerosol-dispensed products. Complete technical description of construction and operation is included. Uniform fineness of spray particles, seal and positive cut-off, and adaptability of all-metal valve are outlined.

Bul JBR Aerosol-Dispensing Valves is issued by Valve Div., Risdon Mfg. Co., Dept. CP, 200 Risdon St., Naugatuck, Conn. When inquiring specify CP 5872 on handy form, pages 2 and 3.

Silver markings plain with improved ink

Silver ink said to have exceptional brightness and opacity, and designed to afford greater contrast when printed on black or other dark materials has been introduced for use with manufacturer's printing and imprinting machines.

Ink is being used successfully on fiber containers, cartons, slab

Won't Smudge!

LABELON
PLASTIC

Write on it

TAPE

STICKS WITHOUT MOISTENING

RESISTS:
DIRT
GREASE
WATER
ACIDS

LABELON TAPE sticks without moistening to any smooth, dry surface—yet strips off cleanly. Write or print on it with pencil, stylus or typewriter. Message **WON'T SMUDGE** . . . defies dirt, grease, water, acids . . . stays clean, easy-to-read—because writing surface is protected by transparent plastic! Available in rolls—or in flat form on backing sheets for typewriter use.

Use Labelon "Write on It" Tape to mark test tubes, glass vessels, test batches, specimens . . . to identify circuits, panel boards, fuel lines, instruments . . . to label stock-room shelves, bins, hard-to-mark objects. Ideal, too, for office files, folders, stored records, etc.
For samples and prices, see your nearest dealer or write Dept. CP-1.



LABELON TAPE CO., INC.
450 Atlantic Ave., Rochester 9, N. Y.

When inquiring check CP 5873 on handy form, pgs. 2-3

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

**HYDRO-SHEAVE®
Drives**

Prevent motor burn-outs from heavy starting loads, by slipping Twin Disc HYDRO-SHEAVE Drives on the end of your motor shafts. Twin Disc Double-Circuit design fluid coupling cushions overloads; permits motor to accelerate to efficient speed and pick up loads smoothly. For motors (and engines) from 1/4 to 50 hp. Write for name of nearest Authorized Hydraulic Dealer.

TWIN DISC
TWIN DISC CLUTCH COMPANY, ROCHESTER, WISCONSIN • HYDRAULIC DIVISION, RAINBOW, IOWA
BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • TOLEDO

When inquiring check CP 5874 on handy form, pgs. 2-3

PACKAGING

rubber, building siding, sponge rubber, plastic sheet material, and rubber-impregnated and twill fabrics.

(Ink 3-P-0972 is made by Adolph Gottscho, Inc., Dept. CP, Hillside 5, N. J. . . . or for more information check CP 5875, pages 2 & 3.)

Handling made easier, shipping losses cut with carton

Manufacturer has announced a different method for packaging steel shot, a blast cleaning and peening abrasive. Shot is now packed in 50-lb fiberboard cartons. These replace conventional 100-lb burlap bags. Shipments are made on disposable pallets holding one ton.

Cartons are said to have many advantages for this product. Handling is easier because of reduction in weight and compact size. Shipping losses are minimized since carton is stronger than burlap, and not easily punctured. Palletizing also aids shipping, saves space in storage. Waterproof tape sealer keeps moisture from reaching product.

From a safety standpoint, puncture wounds caused by wire closures on bags are eliminated. Carton also makes spillage of material less likely, thereby minimizing danger of persons slipping because of shot on the floor.

(Information courtesy of American Wheelabrator & Equipment Corp., Dept. CP, Mishawaka, Ind.)

Cereals, boat kits packed with wire strapping

Illustrated 11-page quarterly carries descriptions of some applications of steel strapping and wire stitching. In-use photos show how boat kits, cereals, logs, "I" beams, and overalls make use of wire strapping and stitching.

Vol. 4, No. 3 of Confab is issued by Acme Steel Co., Dept. CP, 2840 Archer Ave., Chicago 8, Ill. When inquiring specify CP 5876 on pgs. 2 and 3.)

For more information on product at right, specify CP 5877 . . . see information request blank between pages 2 - 3.



Bagpak starts from scratch with everything to make the best—with the woodlands, paper mills, bag plants, experience, skill and dependable supply of the International Paper Company, one of the world's great paper producers.

Bagpak quality is a result of a quarter century of making multiwall bags for practically every major industry in the country. More than four hundred products ranging in cost from a fraction of a cent to dollars a pound are confidently and profitably packed in Bagpak Multiwalls.

When you study your paper bag requirements look for these special features:—

Cushion Stitch Closure—A Bagpak development.

Preform Top and Bottom—A Bagpak introduction.

Up to four color, high quality printing.

Top Quality Paper—complying with Fed. Specs. U U-S 48 b.

Assured paper supply.

Range of sizes from 25 lbs. to 110 lbs. For light

insulation materials, up to 7 cu. ft. capacity.

Variation in piles to resist chemical and physical attack.

And a range of Bag Closing Machines with capacities up to 350 tons a day.

For full information write to Bagpak Division, International Paper Company, 220 East 42nd Street, New York 17, N. Y., Dept. P-15



Bemis B-FLEX

A Better Multiwall Valve Bag FOR LESS!

Look at these B-FLEX benefits:

LOWER BAG COSTS... You'll save up to \$3.25 per thousand.

FASTER PACKING...LOWER PRODUCTION COSTS.

UNIFORM WEIGHTS... stop over-packing.

MINIMUM SIFTING.

Ask your Bemis Man for the complete B-FLEX story.

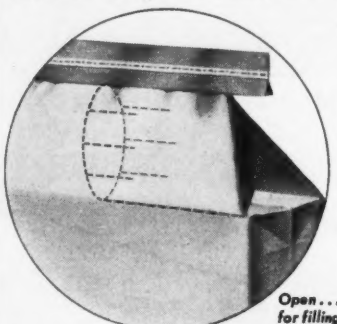
With Bemis B-FLEX Bags, you also get the same bonus you get with all Bemis Multiwalls—**BEMIS MULTI-COLOR PRINTING**... your brand at its finest on multiwall bags.

Bemis



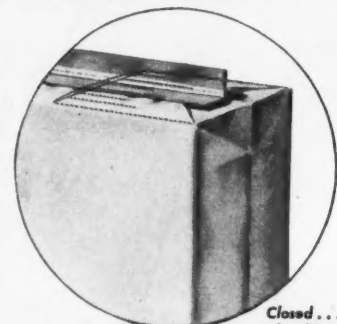
General Offices—St. Louis 2, Mo.
Sales Offices in Principal Cities

Here's Why It's Better...

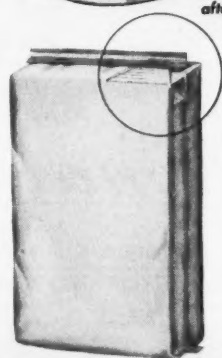


Open...
for filling

The FLEX Does the Trick...



Closed...
after filling



PACKAGING

Supply liquid chemicals in rubber drums of 50 gal capacity

Manufacturer of photographic chemicals has announced that in addition to liquid fixer, developer and replenisher will be available in 50 gal rubber drums. Containers are supplied on a rental basis.

As a dispenser, drums may be used right side up or, as recommended by supplier, suspended above darkroom areas for greatest efficiency and convenience. Literature is available describing proper procedure for suspended operation.

To use drums properly, a stainless steel spigot or valve with $\frac{3}{4}$ " pipe thread is necessary. If drum



Drum may be suspended for more efficiency and convenience

is to be suspended, user must also obtain a metal reinforcing plate which clamps on end of rubber drum. Drum supplier sells these plates which then become property of customer.

(Rapafix, Finex-L Developer, and Replenisher are supplied by Ansco, Dept. CP, 175 Clinton St., Binghamton, N. Y. . . . check CP 5879, pages 2 and 3.)

Bag making bulletin

Illustrated, 6-page bag seaming machine bulletin describes various constructions used in making cloth, paper, and mesh bags.

Bul 262 is issued by Union Special Machine Co., Dept. CP, 400 N. Franklin St., Chicago 10, Ill. When inquiring specify CP 5880, pages 2 and 3.



EXACT WEIGHT Sacking Scales

Cut Labor Costs . . . Eliminate Over-weights

One man can bag, weigh, and visibly check-weigh six to eight bags per minute of free-flowing chemicals from overhead hopper to foot-level conveyor. The savings in labor costs, together with the saving from elimination of over-weights, pays for the installation. Simple to operate, the EXACT WEIGHT Sacking Scale has only two controls. It takes just four easy motions to attach a bag, fill it, weigh it, and release to conveyor. Built for hard service, has agate bearings set in metal, alloy-steel pivots with hard chromed finish, and fittings of stainless steel and brass. Scale will handle multi-wall paper, paper-lined, cotton, or burlap bags. Available with automatic valves. Write today for full details!

Exact Weight Scales

Better quality control

Better cost control

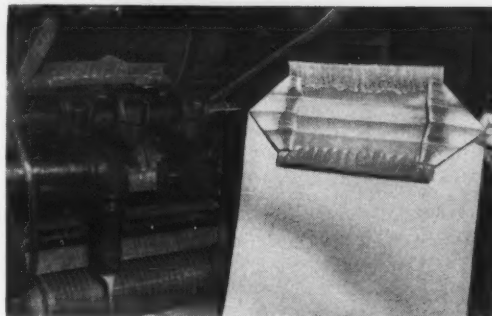
THE EXACT WEIGHT SCALE COMPANY

905 W. Fifth Avenue, Columbus 8, Ohio
2920 Bloor St. W., Toronto 18, Canada

When inquiring check CP 5881 on handy form, pgs. 2-3

When inquiring check CP 5878 on handy form, pgs. 2-3

(Continued from page 97)



Tubes are then fed into "bottomer" which forms bottom at one or both ends of tube in one operation



Tubes, which are to become sewn valve bags, are introduced to a separate machine tucking-in upper corner portion of tube which becomes valve. Sewing one or both ends of tube is the final operation before bags are bundled for shipment

- 3—Horizontal screw or auger packer, for light-weight, finely ground materials
- 4—Multi-spout bag packer, for filling more than one bag at a time using one method
- 5—Manual gross weight hot liquid bag filling, for hot liquid materials which solidify or jelly when cooled to normal temperatures

Auxiliary equipment for these units includes dust tight bag holder or hanger for use with open mouth bags; settling equipment to permit use of a smaller bag; and a bag flattener, to give a uniform shape to filled bags for easier handling and stacking.

The closure of open mouth bags is as important as any of its construction details. There are in general use five methods of closing multiwalls: sewn closure (cotton thread); adhesive closure; wire tie closure (metal wire); stapled or stitched closure (metal wire); tape closure (gummed paper or cloth tape).

After the closing operation, there remains only the storing or shipping of these billions of multiwall bags, handling, at low cost, over 300 products.

(Information and pictures for this article courtesy of Union Bag & Paper Corp., Dept. CP, Woolworth Bldg., New York 7, N. Y.)

THE GREATEST SHOWING OF INDUSTRIAL RUBBER PRODUCTS ON EARTH

1. Special Reprene tube compounded to resist the action of hot oil from compressors, and designed to provide a glass-smooth channel for more efficient air delivery.
2. Chemically treated, rubber-impregnated braided yarn provides increased burst strength and suppleness.
3. Elastic rubber layers promote greater flexibility and prevent chafing of the braided piles.
4. Tough, yellow "Sure-Grip" safety cover resists impact, abrasion and aging.

When you need "The Best"

... that's where Republic's Champion Air Hose fits into your picture.

Built to really "take it," Champion will last longer and give better service on the really tough operations.

And . . . if your operation doesn't demand a really "super" hose, there's a "right" Republic

Air Hose for you . . . a hose especially designed and built to do the specific job for which it's intended.

Ask your local Republic Rubber Distributor for help in selecting Industrial Rubber Products. If his name is not listed in the yellow pages of your telephone directory, write directly to us.



REPUBLIC RUBBER DIVISION

LEE RUBBER & TIRE CORPORATION, YOUNGSTOWN 1, OHIO

INDUSTRIAL RUBBER PRODUCTS

When inquiring check CP 5882 on handy form, pgs. 2-3

The **X,Y,B,M** of OBERDORFER'S NEW BRONZE PUMP PRODUCTION



Every Oberdorfer bronze pump now produced is tested by one of the performance measuring devices designed in our laboratories and illustrated above.

This machine very accurately and rapidly discloses any variations from our high standards of volumetric efficiency at several speeds and pressures, as well as inches of vacuum, power consumption, foundry quality and the degree of precision of machined parts and assembly operations.

Only after each pump has satisfactorily complied with all of our standards is the inspector allowed to stamp (on the right port of each pump) his identification, which might be X, Y, B or M.

This procedure has made possible a uniform high quality production unavailable here before.

The new Oberdorfer pumps are stocked by the leading Industrial Distributors everywhere. Write us for the one nearest you.

OBERDORFER BRONZE PUMPS

Industrial Pump Div., Oberdorfer Foundries, Inc.
641 Thompson Rd., Syracuse, N. Y.

Based on success of these centrifugal wort clarifiers, and the beer clarifiers, pictured in next column, in the Sicks' Breweries Spokane operation, two other Sicks' plants have adopted this method



*processing
equipment*

continuous clarifying eliminates batch settling—increases yield of beer over 4%

Wort: Starting tub no longer needed—
now used as fermenter to increase
plant capacity

Beer: Less floor space used—slurry tanks,
filter presses, washers, screens, etc,
unnecessary

The Sicks' Spokane (Wash.) Brewery, Inc., is the first installation in North America to use centrifuges for production clarifying of both wort and beer, with cost savings reported all along the line, plus production of a more uniform, high quality beer, and sterility of operations.

The centrifuges have paid for themselves in less than a year as a result of increased wort yield alone — wort that was formerly lost in the sludge in the brew kettle. As the clarifiers are totally enclosed, they provide means for absolute sterility in both operations.

Formerly, wort (liquor after mash has been treated by malt enzymes) was settled out in a starting tub for 16 to 18 hours before it went to the fermenters. If the hot wort is not allowed to settle in such a manner, much of the wort solids carries over into the fermenter, where it interferes with the fermentation process, and affects final flavor.

Even when a starting tub is used for settling out the "trub" or turbidity elements, difficulties are still encountered. If the hot wort is cooled too quickly, solids will not settle out properly. If the wort is

allowed to remain at elevated temperatures (starting around 200°F) caramelization and darkening may occur.

Elaborate methods have been developed in the past to control these variables, but they require considerable labor and attention. Since the installation of centrifugal wort clarifiers at Sicks' Spokane plant, the hot wort can be run directly into the cooler and fermenter. Need for the starting tub has been eliminated (it is now used as an additional fermenter). This in effect has added cellar capacity without taking up appreciable additional floor space.

Increased extracting efficiency now allows wort recovery which amounts up to 4% yield in finished beer, states brewery.

Clarified wort, freed of trub before the yeast is pitched, gives a cleaner fermentation. This advantage leaves the yeast free of resinous bitter substances which, when present, can leave a harsh or bitter after taste to the beer.

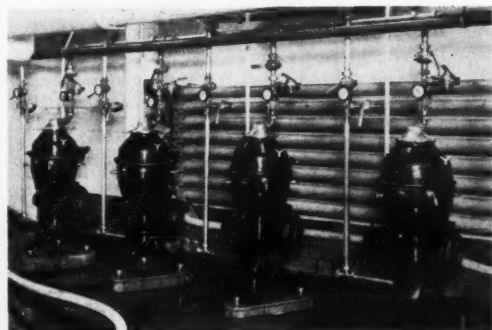
The centrifuge gives a constant clear wort at capacity of 68 to 70 barrels per hour at Sicks'. Sludge holding capacity is large enough to permit an entire brew of 200 to 300 barrels to run through without stopping to clean the bowl. After the run, the wort remaining in the bowl can be saved, amounting to about half a barrel. Since the clarifier lifts the wort to the cooler, a pump is not needed.

Yeast starts to work faster when the hot trub is centrifuged, and settles out more firmly during fermentation. It does not have to be sieved, and the yeast is clearer and whiter. Another advantage noted at Sicks' is that it is easier to clean the fermenting tanks, since there are fewer particles to stick to the glass lining.

Applied to Beer

After fermentation the wort is then known as beer, and is given a "resting" storage of several weeks. Then, ordinarily, it is filtered through diatomaceous earth prior to final aging. Here again was an involved process requiring several steps, including preparation of slurries, screens, and filter pads. Then, at times, a change in line pressure would cause the filtering medium to burst, allowing dead yeast cells to contaminate the vat of filtered beer.

(Continued on page 104)



Battery of four beer clarifiers at Sicks' Spokane plant

BUSINESS IN MOTION

To our Colleagues in American Business...

Revere, like other companies, prefers to avoid rush orders, because they tend to upset orderly scheduling of production and shipment. However, we are not bound by system, and will do everything we can to help when a customer faces a genuine emergency. Sometimes, of course, in spite of the best will in the world, we encounter conditions beyond our control. A metal shortage is one example. But when there is an overwhelming need for speed sometimes we can meet it.

Let us cite a recent case. An important customer on the West Coast had spoiled two circular tube sheets while drilling them. This message was relayed by telephone to our New Bedford mill where we produce these sheets. How soon could we replace them? They were for an important government project. So urgent was the need that the customer offered to charter a plane to fly them to California as soon as they were ready.

A quick check showed that we could make duplicate sheets much more quickly than usual. The specified alloy was in stock, partially processed, so that casting time was eliminated, as well as some of the rolling. It was rolled down to the required gauge, 1 1/8 inch thick, leveled, and cut into two circles, each 98 inches in diameter.

Meanwhile, the Traffic Department worked on the rather complicated problem of determining the fastest, most direct, yet least expensive way to get the circles to the Coast. Because of the weight and the

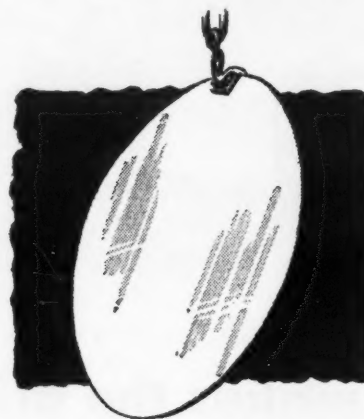
time already saved, shipping by plane entailed a cost that didn't seem justified. Traffic reported that the best solution was to ship by "direct car," which guaranteed no extra handling or trans-shipping en route. This was agreed to by the customer, and four days after he called us, the circles were thus shipped. They arrived eleven days later, in time to meet the deadline.

Was the extra effort required to rush through 5,000 pounds of tube sheets justified? We are sure it was.

Two days after the circles arrived we received a letter from the customer, in which he said: "The promptness with which your company undertook the problem of supplying the two sheets to replace those we had spoiled has been appreciated by all of us. . . . It is most heartening to work with persons who have a real sense of responsibility and concern over their customers' emergency requirements. Your company's performance in this instance left

nothing to be desired and we want you to know that it meant a great deal to all of us."

As we have remarked, we do not relish rushes any more than anybody else, but when there is a situation of real gravity, we will do our best to cope with it. Other suppliers in all industries, we have observed, follow much the same policy, so we suggest that when a genuine emergency arises, tell your suppliers the exact nature of it and ask them what they can do for you. They may be able to find a way to help you, as Revere did in the case just cited.



REVERE COPPER AND BRASS INCORPORATED

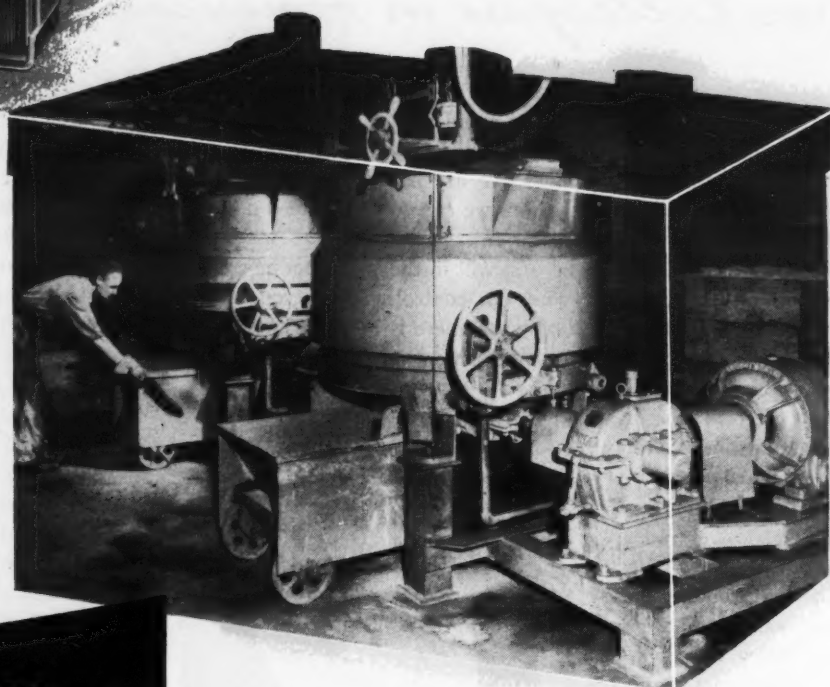
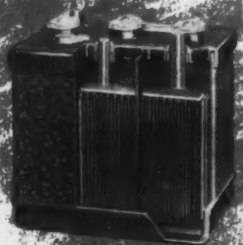
Founded by Paul Revere in 1801

Executive Offices: 230 Park Avenue, New York 17, N.Y.

SEE "MEET THE PRESS" ON NBC TELEVISION, SUNDAYS

When inquiring check CP 5884 on handy form, pgs. 2-3

in preparing STORAGE BATTERY PASTES



mulling

makes the difference!

Have increased production needs reduced your raw material mileage . . . affected your control over quality? A careful appraisal of your mixing facilities may save you money, show you where a good mixer can take the place of extensive revisions to your pasting operations. Long mixing cycles, separate cooling facilities, "hot spots" of trace ingredients mean a poor mix, lost production.

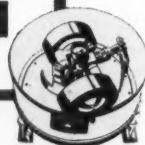
Simpson Mix-Mullers provide an intensive, kneading smearing action. Oxides, acids and water are thoroughly *blended* into one uniform mass. The entire process—mixing, reaction and cooling to pasting temperature—is accomplished *in the mixer*. Quality control is centralized—no special construction is required.

Available in 13 models, in capacities from 1/10 to 60 cu. ft., there is a Simpson Mix-Muller for your needs. Mixing is our business, our only business for over 35 years. Can we show you how MULLING can improve *your* business?



SIMPSON MIX-MULLER® DIVISION

NATIONAL ENGINEERING CO., 640 Machinery Hall Bldg., Chicago 6, Ill.
(Not Inc.)



When inquiring check CP 5885 on handy form, pgs. 2-3

PROCESSING EQUIPMENT

(Continued from page 103)

Use of centrifugal beer clarifiers at Sicks' has resulted in quality and cost advantages comparable to use of centrifuges for wort clarifying. Labor supervision has been simplified and cost reduced by the continuous operation, and elimination of various steps of slurry preparation and filter operation.

Only infrequent bowl cleanings are necessary, and one machine is stopped, cleaned in about 15 minutes, and put back into operation while the others continue to function.

As the centrifuges are hermetically sealed, no CO₂ is lost during clarification, and no air is entrained. There is no foaming problem since the beer is carried through the clarifier under a constant counter pressure. The beer leaves the clarifier at a constant clarity right to the end of the run, whereas in the filter operation, efficiency dropped prior to need for re-packing or re-charging.

Because of the small capacity, high-throughput bowl, cut-off to water for cleaning is sharp. Thus the problem of disposing and wastage of diluted beer is minimized and no rest tanks are needed.

(Clarifiers are manufactured by The DeLaval Separator Co., Dept. CP, Poughkeepsie, N. Y. . . . check CP 5886 on handy form, pages 2 and 3.)

Whirling impeller keeps wall of stock chest clean . . .

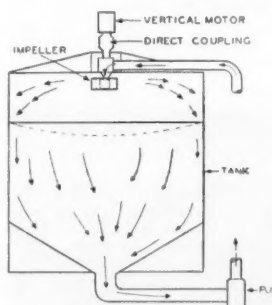
'easily installed unit prevents stock from sticking on wall and drying there

Uses: Prevents stock from sticking or hanging to sides of paper stock chest. Unit eliminates dead pockets around the wall of the chest where stock can stick and dry out.

Features: Can be installed without changing location of charge or discharge piping of chest. Minimum of flow channeling through chest is obtained.

Description: The Side-Flo consists of a vertical motor direct-coupled to an open impeller. It is mounted in the entering suction, with motor and coupling outside the chest and impeller inside.

Stock enters impeller in the center and is immediately thrown to outer chest walls where it settles down to stock level in tank. This causes a slight build-up around the outer circumference of the chest, giving a concave surface the magnitude of which depends upon stock consistency. The added weight around the



Shows paper stock flow in chest equipped with Side-Flo unit

PROCESSING EQUIPMENT

edge causes flow to take place, first along outer circumference. At the same time stock in center of chest is caused to flow due to outer periphery flow. Overall effect is discharge from entire chest cross-sectional area.

Impact of stock hitting wall prevents stock from sticking as level rises and falls.

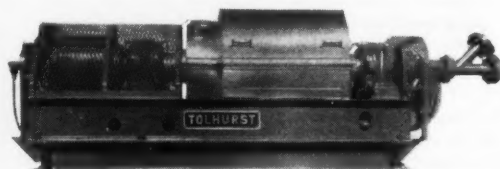
(Unit is a development of Allis-Chalmers Manufacturing Company, Dept. CP, Milwaukee 1, Wis. . . . or for more information check CP 5887 on handy form, pages 2 and 3.)

Quick-change beach speeds is big advantage of 2000G continuous centrifuge . . .

other highlights include adjustable pool depth and self-cleaning feed chambers

Uses: Continuous centrifuge is practical for short runs on different products as well as long runs on one product.

Features: "Vari-Beach" drive permits beach speeds to be changed instantly, from 0 to 300" per minute. Seven different pool depths can be set



Continuous centrifuge

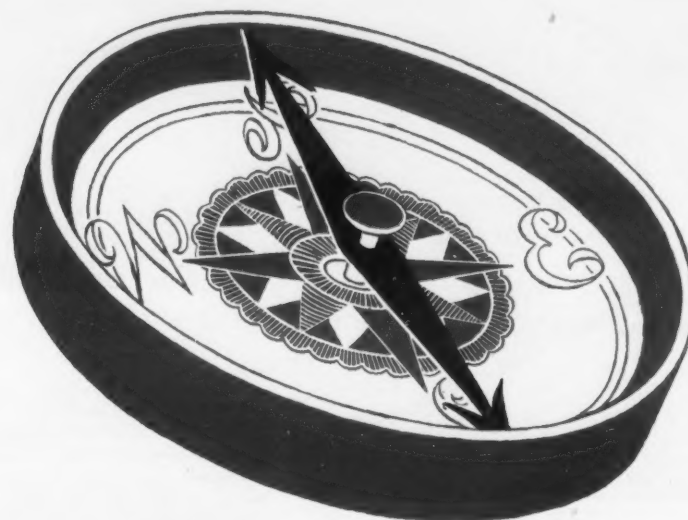
by simple adjustment of "Vari-Pool" orifice plates. Self-cleaning feed chambers minimize down-time when changing from one product to another.

Description: Machine has an available force of 2000G. All rotating parts are mounted on ball or roller bearings. Limited number of the centrifugals are available for 90-day tests in plants of those interested in investigating applications.

(Continuous centrifuge is made by Tolhurst Centrifugals Division, American Machine and Metals, Inc., Dept. CP, East Moline, Illinois . . . or check CP 5888 on handy form, pages 2 and 3.)

Shows complete set-ups for powder blending

Four-page illustrated bulletin describes packaged impregnation and powder blending systems, designed for formulating concentrates and insecticide and fungicide blends. Drawings and photos show typical installations. "Complete Plant Equipment . . ." is issued by The Young Machinery Co., Dept. CP, Muncy, Pa. When inquiring specify CP 5889 on handy form, pages 2 and 3.



YOU CAN'T GO WRONG

*when you turn to Proctor & Schwartz
with your drying problem*

Here's why. Every installation of Proctor drying equipment is backed by these three things: (1) A thorough analysis of the problem . . . (2) Proctor engineers' comprehensive knowledge of sound dryer design . . . and (3) Their reputation for installing systems that perform according to guaranteed specifications.

The background on which Proctor engineers draw when working on a drying problem covers a longer period of time (70 years) . . . and a wider range of products than can be found anywhere else in the world.

Name a product that is being dried commercially and there is a 99% chance it is being done in a Proctor system. This represents a breadth and depth of dryer design experience that is unequalled.

When you have a drying problem—the easiest and safest approach is to call Proctor engineers early. That way you can't go wrong.

Send for new bulletin on Proctor equipment for the Process Industries. Write for Bulletin No. 390.

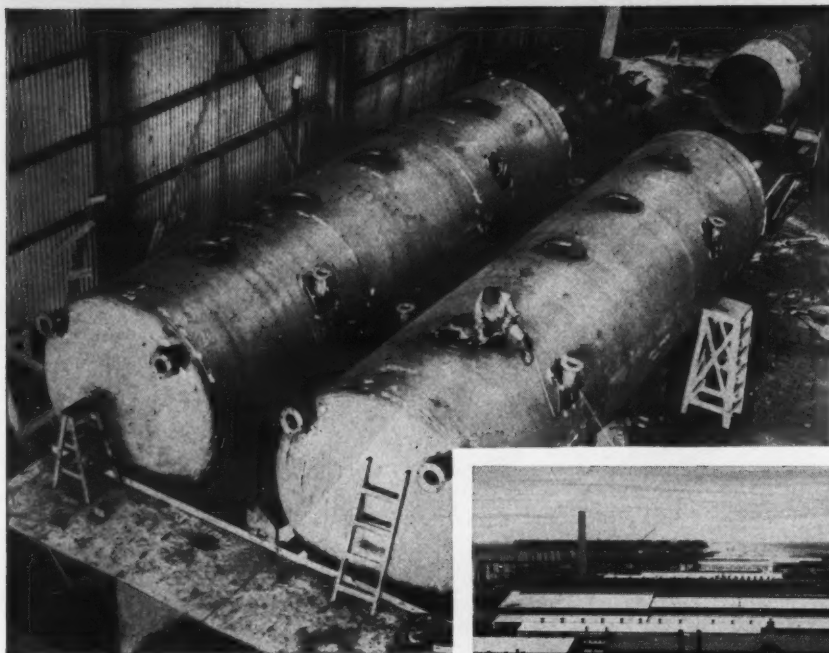
PROCTOR & SCHWARTZ • INC •

PHILADELPHIA 20 • PA •

*The World's First Name in Industrial
Drying Equipment and Processing Machinery*

TRAY DRYERS • TRUCK DRYERS • CONTINUOUS CONVEYOR SYSTEMS
PRE-FORMING FEEDS • INFRA-RED FREEZE DRYING SYSTEMS • SPRAY DRYING •

When inquiring check CP 5890 on handy form, pgs. 2-3



A half mile of pressure vessels

These are two of seventy — over $\frac{1}{2}$ mile — of 38½-foot vacuum tank casings built to meet the quality requirements of a well-known chemical maker.

The buyer also benefits from many savings made possible by Newport News extensive heavy fabrication equipment and the sixty years experience in using it.

Do you plan installations of heavy production equipment? You can command the services of Newport News for weldments of

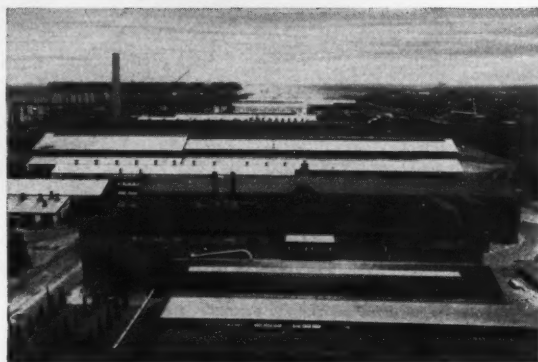
corrosion-resistant, alloy and clad metals in almost any size or shape, plus the required engineering background and complete welding and stress-relieving skills.

It will pay you to get the facts, shown in *Facilities and Products*. As you glance at its photos and brief captions, you'll see why Newport News can turn out — at low cost — specialized heavy equipment for chemical plants.

Send for *Facilities and Products* — free — today.

Newport News
Shipbuilding and Dry Dock Company
Newport News, Virginia

When inquiring check CP 5891 on handy form, pgs. 2-3



A Mile of Shops — Each shop is devoted to a special type of heavy production. Included are complete Machine Shops, casting, forging and other facilities which offer all of the advantages of the execution of the complete job.

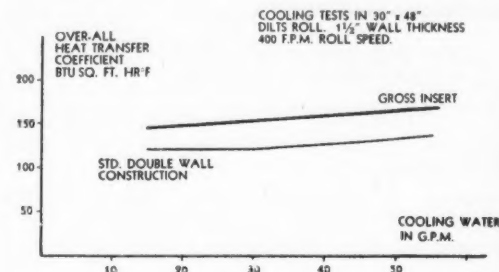
PROCESSING EQUIPMENT

Heating or cooling rate goes up when spiral is put into roll . . .

flexible, self-centering insert can be taken from roll when cleaning is needed

Uses: Inserts improve heat transfer in cooling rolls, flakers, condensers, and similar types of process equipment. A related development, jackets (with the spiral ribs inside), are installed on the outside of pipes and tanks to improve heat transfer rates.

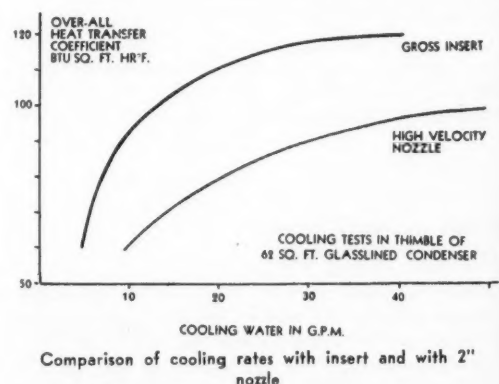
Features: Flexible rubber ribs make cooling water spiral at high velocities past surface to be cooled, thus increasing heat transfer rates. Tests show rate increases of 10 to 50%. Big advantage, however, is



Graphic comparison of heat transfer rates in standard double-wall cooling roll, and in roll having special insert. Only a quarter of the roll surface was immersed in hot oil during the test

that inserts can be removed from vessel, making it easy to clean the roll out. Insert is self-centering once put into the roll or drum; it adjusts itself to roll irregularities, and its rubber spiraling ribs seal effectively, even on rough surfaces.

Description: Essentially, the Gross heat transfer insert consists of a cylinder with rubber spirals running around its surface. When this is inserted into the roll or other heat transfer equipment, the spirals seal against the interior roll surface so that a circling annular passage is provided for the cooling or heating medium. Where the insert has to be put through a



Comparison of cooling rates with insert and with 2" nozzle

small opening, it is built of rubberized fabric for flexibility. Otherwise, it can be made of a steel

PROCESSING EQUIPMENT

shell having the flexible spiraling ribs vulcanized to it.

Pitch of the spiral may be adjusted to give higher or lower cooling-medium velocity as desired. This helps in getting an even temperature across the roll surface.

(Inserts and jackets are supplied by F. R. Gross Company, Dept. CP, 592 Crestview Ave., Akron 20, Ohio . . . or for more information check CP 5892 on handy form, pages 2 and 3.)

Redesign weigh-feeder for injection molding machines

Manufacturer announces that several important design improvements have been incorporated in latest line of his unit for weigh-feeding accurate charges of plastic to injection molding machines.

Specific improvements include simpler and more fool-proof bucket operating mechanism, a more sensitive pivot for greater weighing accuracy, shock-absorbing storage-hopper mounting to prevent transmission of hopper-vibrator shocks to unit's chassis, and easier access to interior parts and beam switch. All adjustments and controls of the weigh feeder are now located on right-hand side for operator convenience.



Redesigned feeder for molding machines

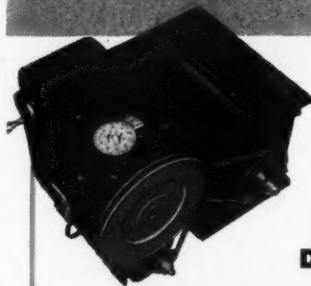
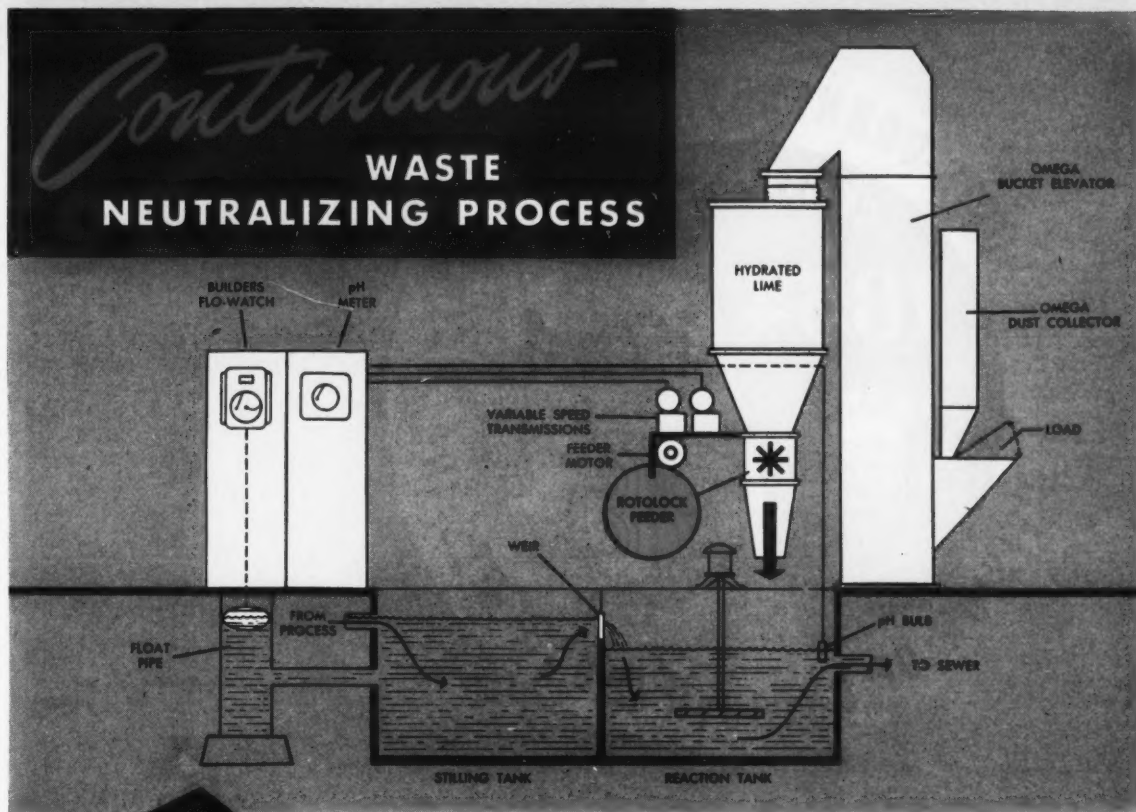
A 350 cubic inch weigh-bucket is now available. Its method of gate operation is said to eliminate seizing and jamming.

(Improved model, the 500 Injecto-Weigh, is made by Glengarry Equipment Corporation, Dept. CP, Bay Shore, N. Y. . . . or for more information check CP 5893 on handy form, pages 2 and 3.)

Catalog covers feeders, mills, mixers, sifters, and more

Complete line of manufacturer's processing equipment for the chemical, food, and feed industries is presented in 36-page illustrated catalog. Specifications and engineering data are given for feeders, continuous mixing systems, rotary sifters, hammermills, net weighers, bag and barrel packers, and elevators . . . all for handling of dry powdered, granular, or crystalline materials.

Cat 801 is issued by B. F. Gump Co., Dept. CP, 1325 S. Cicero Ave., Chicago 50, Ill. When inquiring specify CP 5894 on handy form, pages 2 and 3.



OMEGA ROTOLOCK DOES THE JOB

Omega Rotolock — a rotating vane feeder — feeds hydrated lime into the reaction tank in response to the flow of acid waste (measured by a Builders Flo-Watch Instrument) and to the degree of neutralization (measured by a pH meter).

The Rotolock is a volumetric feeder of simple design and rugged construction, easily adapted to installations requiring proportional pacing by auxiliary meters. The Feeder, powered by a 1/4 HP motor, has a 100 to 1 feed range. Two models of Omega Rotolock Feeders are available, covering the complete range of feeds from 7.2 to 300 cu. ft. per hr.

OMEGA



(Division of B-I-F Industries)



Here's how Omega helped a customer's engineer solve a waste treatment problem for one of the nation's leading manufacturers of electrical and electronic equipment. This acid waste neutralizing "equipment package" comprises feeding, controlling, and metering units required for continuous, accurate operation . . . Omega bucket elevator, dust collector, storage hopper, Rotolock Feeder, and Builders Instruments and Control Panel. Performance of this "package" under actual job conditions has proven again that it pays to take advantage of Omega's engineering and manufacturing experience, when you need continuous proportioning equipment.

Hundreds of today's processing and production problems are being solved by Omega "packages" — for waste treatment, for proportioning two or more solids, for proportioning liquids and solids. Our engineers can help you —

Send Coupon →

OMEGA MACHINE COMPANY

387 Harris Ave., Providence 1, R. I.

☐ Send Bulletin 45-HB describing Omega Rotolock Volumetric Feeders.

Our process problem involves:

- ☐ Waste treatment ☐ Proportioning solids
☐ Proportioning liquids and solids

Name _____

Company _____

Street _____

City _____

State _____

When inquiring check CP 5895 on handy form, pgs. 2-3



Air-handling specialists for 100 years

Starting in 1854 with the invention of the Rotary Positive Blower by our founder, Francis M. Roots, our company's services to industry were, for many years, devoted exclusively to air-handling problems.

As industry developed new applications of gases for fuels and chemicals, it was a natural step for us to move into this field because the general principles of moving and measuring air and gas are so closely similar.

Thus, Roots-Connersville service has been widened to include seven basic types of equipment for handling gas or air. The most recent development has been the new Spiraxial Compressor, first marketed in 1953.

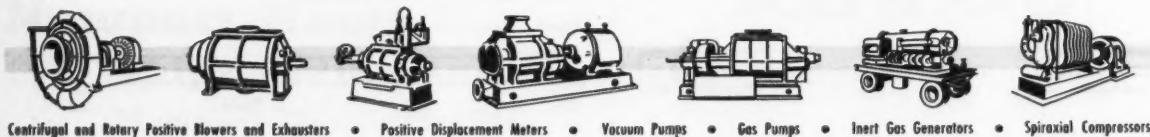
So, for a century we have been engaged exclusively as specialists in handling gas and air. That is our only business. We like to think that this is one of the important reasons why Roots-Connersville equipment has been so widely accepted and has proved so satisfactory in every industry where processing involves the movement of air or gas.

The growth which we have experienced over 100 years could not have been possible without the loyal support of our many thousands of customers. We thank them for this evidence of good will—and we offer the same high type of equipment and service to any industry that has a problem of moving gas or air.

ROOTS-CONNERSVILLE BLOWER

A DIVISION OF DRESSER INDUSTRIES, INC.
154 Richland Ave. • Connersville, Indiana

Reg. U.S. Pat. Off.



When inquiring check CP 5896 on handy form, pgs. 2-3

PROCESSING EQUIPMENT

Generates atmosphere needed for heat treating of steel, powder metallurgy . . .

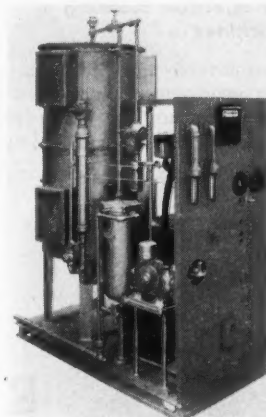
all parts of safe and simple unit are mounted on structural steel base

Uses: Produces a controlled atmosphere for use in heat treating of steels, carburizing and carbonitriding, and for sintering and powder metallurgy processes that require a reducing atmosphere.

Features: Complete-package unit has air filter, air-gas mixing machine, gas cracking chamber, gas cooler, control panel, and power transformer all mounted on structural steel base. Operation is reported as safe and simple, and no special supervision is required.

Description:

Desired atmosphere is obtained by burning controlled mixture of air and gas under catalytic conditions in a heating chamber. Atmosphere, made up almost entirely of carbon monoxide, hydrogen, and nitrogen, is cooled by heat exchange with water after it leaves the retort.



Single frame holds all essential parts of gas generator

Easily removed parts simplify inspection and maintenance. Catalyst can be removed quickly and easily even while generator is at temperature.

Unit is available in three sizes: 300, 500, and 750 cubic feet per hour.

(Endothermic gas generator is a development of Hevi Duty Electric Company, Dept. CP, Milwaukee 1, Wis. . . check CP 5897, pages 2 and 3.)

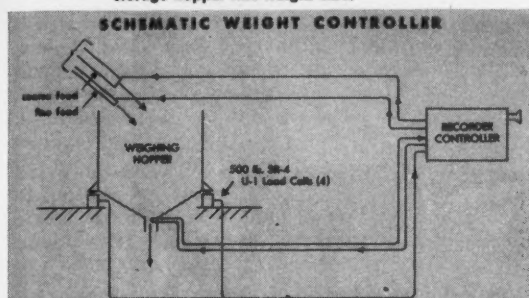
Centrifugal separator operates around the clock

Guide explains five basic separations accomplished by centrifugal separator. Charts and other data describe control of concentration, washing, clarification, soluble recovery, and classification in chemical and food processing applications. Special principle allows fully continuous separation 24 hours a day. This function builds up concentration; prevents particles from accumulating inside rotor; permits use of large-diameter, non-clogging nozzles; and achieves stable separation equilibrium.

"Centrifugal Separation Guide" is available from Merco Centrifugal Co., Dept. CP, 150 Green St., San Francisco, Calif. When inquiring specify CP 5898 on handy form, pages 2 and 3.

SR-4[®] Devices in Industry — Uses Unlimited

Problem: How to weigh automatically an expensive plastic from storage hopper into freight cars.



Block diagram—SR-4 Automatic Weighing System. Outputs of four 500 pound U-1 SR-4 Load Cells are totalized into strip chart recorder-controller which furnishes a complete record of each weighing cycle including final and initial weights.

Solution: A leading chemical company does it rapidly and accurately with a fully automatic SR-4 Weighing System.

This SR-4 System is giving all of these advantages:

- System will pay for itself quickly due to its very high accuracy in weighing large daily shipments of such an expensive material.
- Speed of operation (less than two minutes per 1000 lb. cycle) cuts costs.
- Only one operator needed . . . just part time.
- Automatically furnishes complete record of each weighing.
- Rugged construction minimizes maintenance.

For latest technical information please write to Baldwin-Lima-Hamilton Corp., Dept. 3006, Philadelphia 42, Penna.

TESTING HEADQUARTERS

BALDWIN-LIMA-HAMILTON
Philadelphia 42, Pa.

When inquiring check CP 5899 on handy form, pgs. 2-3

J. E. SIRRINE CO.
GREENVILLE • SOUTH CAROLINA

Engineers
ESTABLISHED 1902



PLANT DESIGN & SURVEYS • CHEMICAL • ELECTROCHEMICAL •
METALLURGICAL PRODUCTION • TRADE WASTE DISPOSAL •
WATER SUPPLY & TREATMENT • ANALYSES & REPORTS

When inquiring check CP 5900 on handy form, pgs. 2-3

PROCESSING

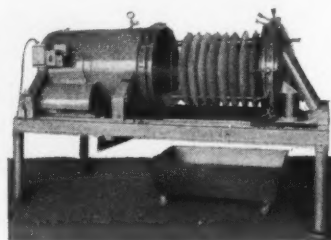
Filter connections stay as tank retracts . . .

one-minute opening quickens entire filtering operation

Uses: Filtration of wide range of materials, including those liquids having a high percentage of solids.

Features: Tank retracts without disconnecting pipe connections. Manufacturer states one man can open filter, clean a 2000-lb cake, and have it back in operation again in less than 30 minutes. The opening itself only takes a minute.

Description: Model MCR retractable tank filter is available in sizes from 100 to 2000 sq ft of filter area. The circular double-surface screen plates are reinforced



Retractable tank filter

to withstand very high filtering pressure. Tanks are made in mild steel, stainless steel, or other metals. Or they can be lined with rubber or plastic.

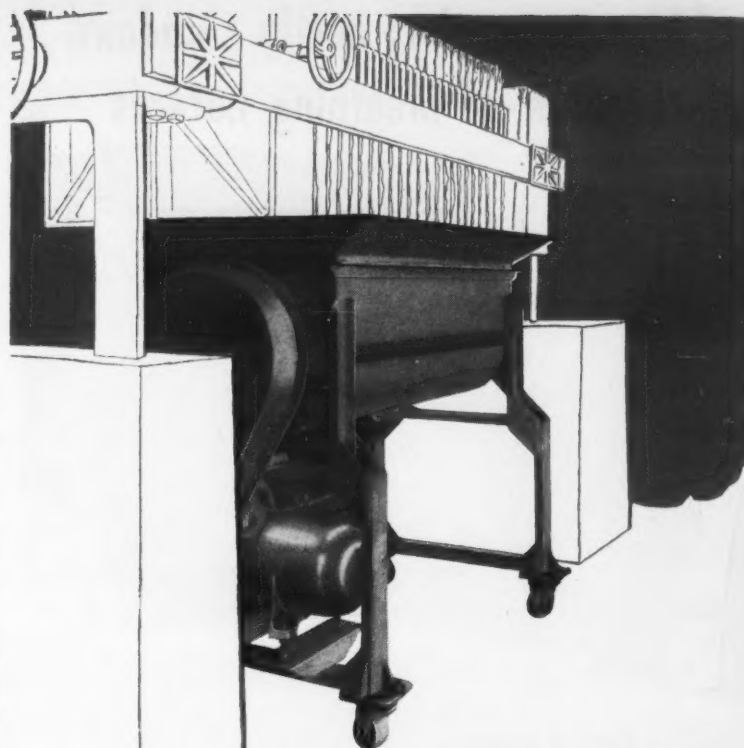
In opening, head bolts are released by one lever, following which the tank is retracted by pushing switch.

(Filter is a development of Sparckler Manufacturing Co., Dept. CP, Mundelein, Ill. . . . or for more information check CP 5901 on handy form, pages 2 and 3.)

Fluid-bed roasting of zinc concentrates

Four-page bulletin discusses how fluidized roasting can be employed with zinc concentrates. Sectional drawing reveals how system operates. Some operating results from actual installation are included.

Bul 7501 is issued by The Dorr Company, Dept. CP, Barry Place, Stamford, Conn. When inquiring specify CP 5902 on handy form, pages 2 and 3.



PIGMENT MANUFACTURER BREAKS PRODUCTION BOTTLENECK WITH READCO MIXERS

A large producer of water soluble paint pigments faced a problem confronting many management men . . . how to get more production—in a hurry.

In an analysis of his process, a bottleneck was found. Pigment solids were being removed from the emulsion in filter presses. Unmanageable filter cake was being scraped from the presses and shoveled into drums, a costly, time-consuming process.

A series of laboratory tests pointed out the simple solution. A battery of Readco Spiral Ribbon Mixers was installed beneath the presses. These mixers reduce the cake into a homogeneous, semi-liquid mass, ready for shipment. Processing time and costs have been greatly reduced.

You can approach your production problems in the same way. The Read Standard Corporation not only manufactures a broad line of chemical processing equipment, it offers you the services of its engineering specialists and laboratory facilities to assist you in the solution of your special processing problem.

READ STANDARD
CORPORATION

BAKERY-CHEMICAL DIVISION, York, Pennsylvania—Los Angeles 39, California

When inquiring check CP 5903 on handy form, pgs. 2-3

**"This is our last costly shutdown
because of breathing hazards**



**... Order some
Scott Air-Paks
and get those repair
jobs done in hours
instead of days"**

SCOTT AIR-PAKS, our men could have gone into those fumes and finished the job in a few hours!

Ed: That's right...and our safety men tell me SCOTT AIR-PAKS can be put into operation on the double...plus the fact that they have the *lowest operating cost* of any breathing equipment.

S.D.: How soon can we get SCOTT AIR-PAKS here so this won't happen again? We've got to maintain continuous production.

*Why not get on the phone or wire
Scott for the name of their nearest
Safety Equipment Distributor.*

Ed: Right! The man hours we've already lost would pay for a carload of SCOTT AIR-PAKS. We can't afford to slow up production any longer just because our maintenance men don't have efficient breathing equipment.

S.D.: We certainly can't. It took too long to clear out the fumes so that our men could make the repairs in safety. If we had



FOR SAFETY—FOR SERVICE

SAFETY EQUIPMENT DIVISION

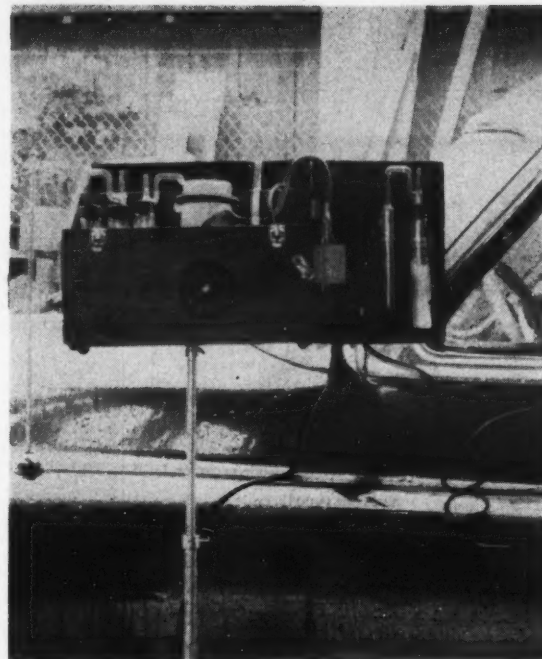
SCOTT AVIATION CORP.

242 ERIE ST., LANCASTER, N. Y.

CANADA: SAFETY SUPPLY CO. TORONTO — BRANCHES IN ALL PRINCIPAL CITIES
EXPORT: SOUTHERN OXYGEN CO. 157 Chambers Street, New York 7, N. Y.

When inquiring check CP 5904 on handy form, pgs. 2-3

safety



Sampling with the instrument in an outdoor air survey.
Tripod keeps sampler at breathing level

SIX VOLT CAR BATTERY RUNS AIR SAMPLER

**Compact unit provides all that is
necessary to conduct air sampling
for dusts, gases, and vapors
encountered in industry**

Uses: To collect air-borne material for use in conjunction with industrial health investigations of workshop atmosphere and outdoor atmosphere in air pollution studies.

Features: Although operating on 110 volt, 60 cycle current, due to its low current consumption (two watts) sampler operates conveniently from six volt storage battery through converter. Unity has plug to insert in automobile cigarette lighter receptacle.

Description: Air sampler is collecting device that causes air to be drawn at a constant rate through scrubbers in which

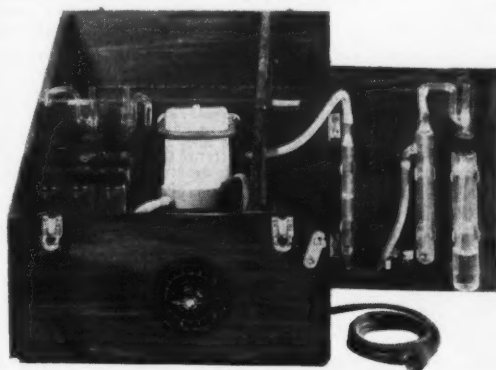
are placed solutions or other media best suited for absorption of air or gas contamination to be determined.

Solutions are kept in nine glass tubes for which there are three glass inlets. One inlet terminates in 0.6 mm opening which traps respirable-size dust for making dust counts. Second inlet has 1 mm opening, is used for collecting gases and vapors easily absorbed. Third inlet is of fritted glass, is used for collecting vapors in water and in certain organic solvents. Once selection of inlet for some particular air-borne material has been made, same borne material has been made, same inlet is used for taking any number of samples by removing it from one sampling tube or scrubber and placing it in another.

Many contaminants, when present singly, may be determined by "freeze out" method

and silica gel or charcoal absorption method. Additional clamp has been provided so tube body may be partially below case and will immerse in cooling solution. Tests can be made using the suction and timing units and colorimetric tubes for determination of carbon monoxide, hydrogen cyanide and hydrogen sulfide.

Rotameter furnished with unit has been designed to function for capacity of pump. It can be calibrated within a flow rate range which is compatible with anticipated performances of inlets.



Gases and solvent vapors which present health hazards when not properly controlled can be detected on the spot with compact sampler

Mechanical timer is provided for long-period unattended air sampling, in which case, unit will automatically shut itself off. It can be used as a switch for turning current on and off when short-period sampling is undertaken.

When taking a sample, tubes are filled with proper absorbing solution and unit is transported to sampling location. Unit is plugged into 110 volt AC source and raised to proper level for representative sampling. Timer is set and adjustments for desired rate of flow made by rotating small knob on top of pump. There is nothing to assemble other than setting up tripod for supporting scrubber at breathing level.

(Air Sampler is available from Joseph B. Ficklen, 3rd, Dept. CP, 1848 E. Mountain St., Pasadena 7, Calif. . . . or for more information check CP 5904A on handy form, pages 2 and 3.)

Novel method explained on page 164 shows how to determine molecular weight from refractive index and boiling point.



As never before...

Today we are all aware of the disastrous and far-reaching effects of a major industrial fire. Owners . . . management . . . employees . . . customers . . . almost every one suffers, in one way or another, when a serious fire strikes.

Could it happen to your plant? Now is the time to take a long, close look at your plant's fire protection measures. Remember, the local fire protection ordinances normally only set minimum standards. Compliance with these ordinances is no guarantee of fully adequate firesafety.

One way to be absolutely sure of the efficiency of your plant's fire protection facilities is to call in an expert C-O-

TWO Fire Protection Engineer. He is ready and willing to help you with any or all industrial fire hazard problems.

There is a personal sense of responsibility inherent with C-O-TWO Fire Protection Engineers that assures you of fully adequate firesafety . . . a definite plus in your behalf. Whether it's fire detecting or fire extinguishing . . . portables or built-in systems . . . C-O-TWO means top quality backed by experienced engineering that results in operating superiority for you at all times.

WHEN BUSINESS STOPS . . . INCOME STOPS!

Don't take chances with your investment. Secure the benefits of highly efficient fire protection engineering today . . . our extensive experience over the years is at your disposal without obligation. Get the facts now!



MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT
Squeeze-Grip Carbon Dioxide Type Fire Extinguishers
Dry Chemical Type Fire Extinguishers
Built-In High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems
Built-In Smoke and Heat Fire Detecting Systems

C-O-TWO FIRE EQUIPMENT COMPANY
NEWARK 1 • NEW JERSEY

C-O-TWO FIRE EQUIPMENT OF CANADA, LTD. • TORONTO 8 • ONTARIO

Sales and Service in the Principal Cities of United States and Canada

AFFILIATED WITH PYRENE MANUFACTURING COMPANY

When inquiring check CP 5905 on handy form, pgs. 2-3

THOROUGHLY TESTED
COS. NO. MORE • SUPERIOR WATER DISTRIBUTION •
FOR EXPOSED PIPING SYSTEMS • FOR CONCEALED PIPING SYSTEMS •
• FOR EXTRA HALLOWED FIRE PROTECTION • PERMIT WIDER SPACING
• GREATER SPRINKLER EFFICIENCY • NO COSTLY PIPING CHANGES
• LOWER INSTALLATION COST
• LESS TOTAL WATER VOLUME
• IMPROVED PROTECTION
• FEWER HEADS OPERATE
• INTERCHANGEABLE
• FULLY APPROVED
• FOR EXTRA HAZ
• IMPROVED
• EFFICIENT • FE
• THOROUGH
• CONCEALED
• SUPERIOR WATER DISTRIBUTION • GREATER SPRINKLER EFFICIENCY
• NO COSTLY PIPING CHANGES • U. L. LISTED
• LOWER INSTALLATION COST • FEWER HEADS NEEDED • F. M. APPROVED

Automatic SPRAY Sprinklers
AT NO EXTRA COST
IMPROVED FIRE PROTECTION

At our modern Youngstown laboratory facilities, development of new devices like "Automatic" SPRAY Sprinklers, as well as other improved methods of detecting, controlling and extinguishing fire, insure the truth of our slogan—**"Automatic Sprinkler—FIRST IN FIRE PROTECTION."**

"Automatic" Sprinkler
CORPORATION OF AMERICA
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Send for FREE Literature Today!
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Please rush copy of Bulletin 70,—
"Automatic" SPRAY Sprinklers.

Name.....
Title.....
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Address.....
City..... State.....

When inquiring check CP 5906 on handy form, pgs. 2-3

SAFETY

Two-hand control clutch prevents tying down machine . . .

controls must be pressed simultaneously

Device prevents tying down or cheating on manually operated power machines. If one switch is pressed before the other, trip-



Keeps hands out from under

ping mechanism becomes inoperative and must be reset by button on control box. Unit is available as a package for installation on existing presses.

Unit may be used with single switch control in applications where one hand is otherwise occupied. It also permits single stroke control for positive mechanical clutch machines and automatic cycling control for hydraulic, pneumatic, or friction clutch machines.

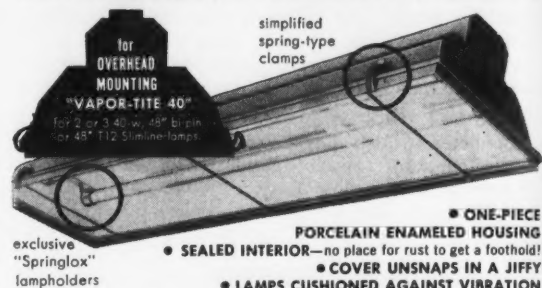
(Micro Trip is product of Micro Div, Minneapolis-Honeywell Regulator Co., Dept. CP, Freeport, Ill. . . . or reader may secure more information by checking CP 5907 on convenient Reader Service slip between pages 2 and 3.)

Explains automatic shut-off valves

Bulletin describes valves recommended for use on gas or fluid lines where automatic shut-off is required. Weights, dimensions and typical applications are presented for a variety of models. (Four pages, two colors)

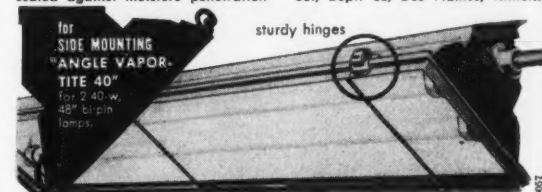
Bul 132-D4 is issued by Security Valve Corp., Dept. CP, P.O. Box 1551, Los Angeles 53, Calif. When inquiring specify CP 5908 on handy form, pages 2 and 3.

BENJAMIN VAPOR-TIGHT FLUORESCENT LIGHTING UNITS LICK HUMIDITY AND DIRT PROBLEMS



Where excessive dirt, dust, smoke, corrosive fumes or moisture-laden air present lighting problems, the best answer is Benjamin Vapor-Tight Lighting Equipment. These units withstand such adverse atmospheres with a minimum of maintenance and trouble-free performance. They're sealed against moisture penetration

by an extruded rubber gasket and moist-proof conduit entrances. They defy humidity with an over-all coating of "Life-Time" porcelain enamel. For full details on how to lick your problems of lighting humid and dirty locations, send for FREE BULLETIN VT. Benjamin Electric Mfg. Co., Dept. LL, Des Plaines, Illinois.

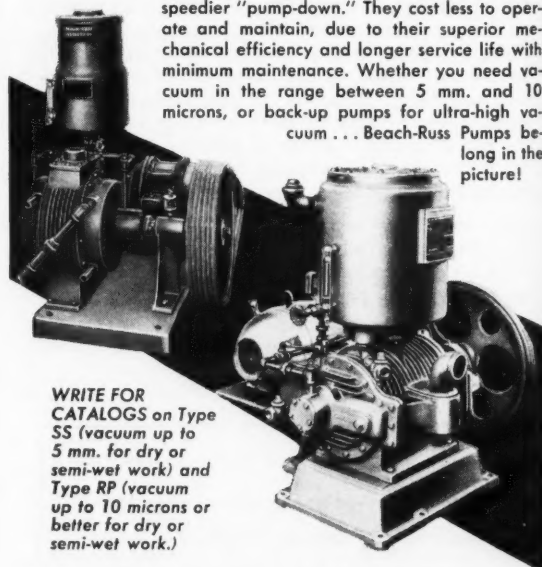


When inquiring check CP 5909 on handy form, pgs. 2-3

WHATEVER YOUR WORKING VACUUM MAY BE . . .

Get It Faster and Pay Less to Hold It!

Beach-Russ Rotary Vacuum Pumps give you speedier "pump-down." They cost less to operate and maintain, due to their superior mechanical efficiency and longer service life with minimum maintenance. Whether you need vacuum in the range between 5 mm. and 10 microns, or back-up pumps for ultra-high vacuum . . . Beach-Russ Pumps belong in the picture!



WRITE FOR CATALOGS on Type SS (vacuum up to 5 mm. for dry or semi-wet work) and Type RP (vacuum up to 10 microns or better for dry or semi-wet work.)

BEACH-RUSS COMPANY
46 CHURCH STREET • NEW YORK 7, N. Y.

When inquiring check CP 5910 on handy form, pgs. 2-3

CHEMICAL PROCESSING

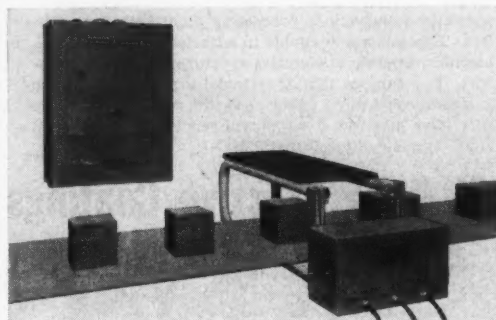
SAFETY

Detector unit sounds warning when metal is present in non-metal processes

Uses: For detecting metal particles in manufacturing processes involving inspection of non-magnetic and non-conductive materials.

Features: Unit can be installed around conveyor systems without cutting belt.

Description: Equipment consists of two main components, electronic cabinet and inspection coil system. Control cabinet contains electronic components and bridge circuits which are enclosed.



Sounds alarm when metal particles are detected

On outside of gasketed door are controls and indicators for operation of equipment. Green light indicates when power is applied and red light flashes when metal is detected. Red light is operated by relay having auxiliary contacts for other types of alarms, either audio or visual, or to actuate a control circuit.

Coil unit consists of inspection coils and junction box containing necessary transformers. Coils are 1½" diameter aluminum tubes and are attached to heavy aluminum straps on junction box. They may be slipped over conveyor type installation and bolted to junction box without disturbing system.

In operation, device detects metal by perceiving effect of metal particles on characteristics of an inductance bridge circuit. Coils which make up inspection unit are elements of this bridge circuit, and a metal particle coming into inspection aperture causes bridge to become unbalanced electrically. Output (or unbalance signal) of bridge is then amplified and used to operate appropriate alarm or control. Yellow light indicates when balance system is not operating or is losing sensitivity.

Application of detector has been made in industrial food operations to detect metal particles in cereals, candy bars, and other packaged food products. It has also been used in paper and lumber industries by immersing unit in log pond and floating logs through for metal inspection. In mining operations it detects metals in non-magnetic and non-conductive types of ore.

(General Purpose Metal Detector is a product of the General Electric Co., Dept. CP, 1 River Road, Schenectady, N. Y. . . . or for more information check CP 5911 on handy form, pages 2 and 3.)

"Meet me at the show!"

(It's going to be grate!)

National
**PLANT MAINTENANCE AND
 ENGINEERING SHOW**
 International Amphitheatre, Chicago, Illinois
 January 26-28, 1954
KLEMP BOOTH 1740

KLEMP

We Tread the World with Safety

KLEMP METAL GRATING CORPORATION
 1371 NORTH BRANCH STREET, CHICAGO 22, ILL.
 Plants and Warehouses at Chicago, Illinois and Houston, Texas
*Manufacturers of the Most Diversified Line of Gratings in the World
 Including HEXTEEL and FLOORSTEEL Surface Armors, Open Welded and
 Diamond Riveted Gratings, Stair Treads.*

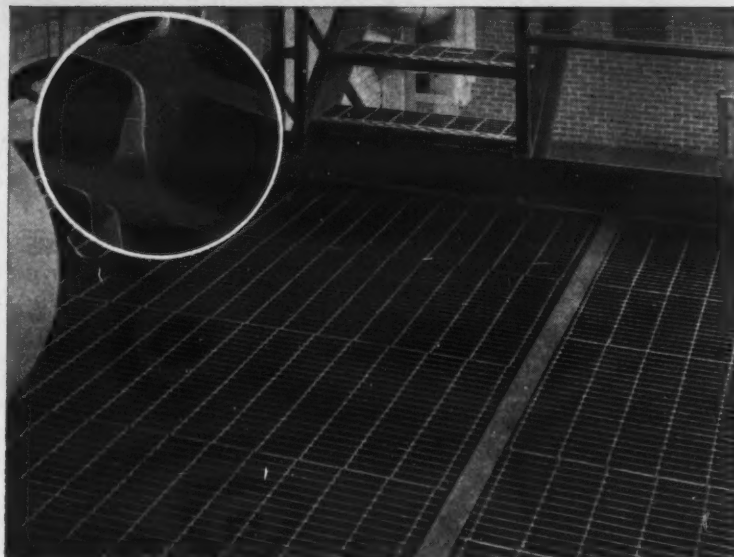
MEET Klemp's charming hostess, Tudy Golden—as smart as she is beautiful. She'll be on hand, along with Klemp engineers, to show you our products—particularly the patented, world-famous HEXTEEL® and FLOORSTEEL® Surface Armors which will be shown imbedded in concrete, asphalt and other cold mastics.

Never before has floor maintenance presented such costly problems to plant engineers. Today's crushing loads make it absolutely essential that you investigate every type of material that will prevent yearly floor disintegration. Hundreds of industries have discovered that HEXTEEL and FLOORSTEEL (1) cut floor maintenance costs to a mere fraction; (2) preserve floors for the lifetime of a plant! Let's talk things over—and get the lowdown on costs from Klemp engineers, the men who've made the study of floor problems their life work.

You'll also have a chance to examine Klemp's Welded and Diamond-Riveted Gratings and Stair Treads, the choice of experienced plant engineers for almost half a century.

See you at the show!

When inquiring check CP 5912 on handy form, pgs. 2-3



Grating by BLAW-KNOX

where can you use steel grating?

You undoubtedly use a lot of steel grating in your plant—floors, platforms, walkways, catwalks and stair treads, for example.

But how about grating for fan guards and shelving—for covering open pits and light wells? And how about other uses throughout your plant that no one has thought of—as steel grating is adaptable to many uses.

If you have any problem about a common application or an unusual application or a possible application, we'll be glad to hear from you. And to give you a prompt answer.

Only Blaw-Knox Electroforged® Steel Grating and Stair Treads

—have these five exclusive features:



1. rigid one-piece construction—easy to install
2. all surfaces accessible—easy to paint
3. no sharp corners to dog—self-cleaning
4. maximum open area—for light and ventilation
5. non-slip twisted crossbar—safe footing

A short note will bring you a copy of new Bulletin No. 2365-R—a dimensional sketch will bring you a quotation.



BLAW-KNOX COMPANY

2076 Farmers Bank Building • Pittsburgh 22, Pennsylvania

BLAW-KNOX EQUIPMENT DIVISION GRATING DEPARTMENT

GRATING APPLICATIONS: floors • platforms • walkways • catwalks • stair treads • fan guards • shelving • and many other uses, both outdoors and indoors, for versatile steel grating.

When inquiring check CP 5913 on handy form, pgs. 2-3

SAFETY

Pressure-packed spray treats burns quickly, easily, safely . . .

forms non-hardening mechanical protective film, relieves pain

Development of a pressure-packed aerosol spray, for treatment of burns (thermal, actinic, chemical, mechanical, or electrical) of all degrees of severity, has been announced.

The medicament, Hexathricin, is said to have proved successful in tests by industries and hospitals. When sprayed on the burned area, it forms a non-hardening film which aids in preventing infection, relieving pain, and increasing percentage of grafting "takes."

Hexathricin Aeropak makes medication very easy to apply (press valve, spray on), and saves time and personnel. Dressings are optional, and burns may be treated after Hexathricin application by exposure method, with light gauze dressing, or with pressure dressings, as desired by physician. Medicament is reported useful in both emergency and routine treatment.

(Hexathricin Aeropak for treatment of burns is a product of Lincoln Laboratories, Inc., Dept. CP, Laboratory Park, Box 1139, Decatur, Ill. . . . check CP 5914 on handy form, pages 2 and 3.)

Rolling doors meet 9 requirements

According to informative bulletin, manufacturer's line of doors meet nine requirements—(1) quick, easy operation; (2) space saving; (3) greater durability; (4) fire protection; (5) maximum safety; (6) general protection; (7) neat appearance; (8) economical installation; and (9) "Registered" life extension.

Complete line of doors include steel service doors, fire doors and shutters, folding doors, steel rolling grilles and special doors. Features, uses and dimensional data are given in 32-page, illustrated bulletin.

Bul 75 is issued by The Kinnear Manufacturing Co., 820-870 Fields Ave., Columbus 16, Ohio. When inquiring specify CP 5915 on handy form, pages 2 and 3.

What a good "painting" program should do for you

EFFECTIVENESS of Ucilon Protective Coatings used for corrosion control in processing plants can be gauged by several obvious results of the program:

1. They have helped lengthen service life of equipment and reduced downtime
2. They have increased the interval between repainting
3. They have maintained a better looking plant



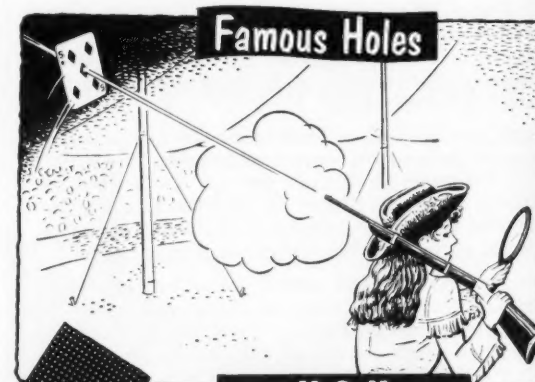
Ucilon* Protective Coating Systems were developed as specialized answers to processing plant painting problems. Systems are available to withstand acids, alkalis, alcohols, organic chemicals, moisture, salts and exposure. You can see that they make a painting program less costly and more effective by the many cases where they have given up to 5 years of service under severest conditions. Send for Bulletin MC-7.

*Trade Mark

UCILON Protective Coatings

Trade Mark
One Group of the Many **UCILON** COATINGS FOR METALS
UNITED CHROMIUM, INCORPORATED 100 East 42nd Street, New York 17, N. Y.
Detroit 20, Mich.—Waterbury 20, Conn.—Chicago 4, Ill.—Los Angeles 13, Cal.
In Canada: United Chromium Limited, Toronto, Ont.

When inquiring check CP 5916 on handy form, pgs. 2-3



H & K Perforated Holes

Annie Oakley may have started all this perforating business, but never on a wholesale basis as do H & K. As you know —

"If it can be perforated — H & K can perforate it!" Difficult perforating involving stainless, large volume perforating of metals, plastics, hardboard; small orders for special needs; holes 9" diameter or small holes to precision tolerances—are all in a day's work and painstakingly produced. We have been building dies for more than 70 years, thus permitting us to provide practically any pattern of round holes, slots, squares, triangles, other shapes and many ornamental patterns from which to choose.

The Harrington & King PERFORATING CO.

Ask for Catalog No. 62 for complete data.

5636 Fillmore Street, Chicago 44, Illinois
114 Liberty Street, New York 6, New York

When inquiring check CP 5917 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Redesign of wheeled extinguisher adds to effectiveness in fire fighting . . .

due to increased regulator capacity, operating pressure reached in 12 sec instead of 25

Replacing manufacturer's wheeled fire extinguisher A-models are models 150-B and 350-B incorporating various design improvements. New nozzle and gas tube design and stepped-up rate of flow reportedly increase the fire fighting effectiveness of the extinguishers by 50%. Models employ dry chemical as extinguishing agent.

Incorporated in the special nozzle design is a new sealing principle (floating plug seated against a rubber pad) to insure water and gas-tightness.



Design improvements reportedly increase wheeled extinguisher's fire fighting effectiveness by 50%

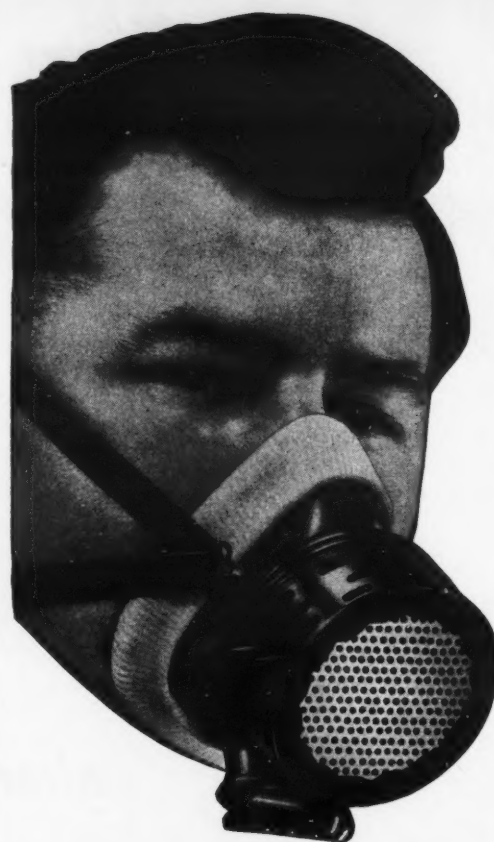
Patents are pending on several features of the nozzle, manufacturer reports.

Dry chemical flow has been increased 30% by redesigning the gas tube in the dry chemical chamber, permitting efficient use of larger nozzle orifices. Range of the dry chemical stream is 40 feet.

Operation and maintenance have been simplified by the addition of a check valve in the gas tube and a pressure gage in the nitrogen cylinder valve. Due to increased regulator capacity, operating pressure on the 350-B extinguisher can be reached in 12 seconds instead of 25 seconds.

Overall dimensions of the 150-B are: height-55 3/4 inches, width-30 inches. Weight is 525 pounds. The 350-B is 60 inches high, 35 inches wide and weighs 1080 pounds.

(Announced by Ansul Chemical Co., Dept. CP, Marinette, Wis. . . . or for more information check CP 5918 on convenient Reader Service slip between pages two and three.)



1 FACE PIECE — 7 CARTRIDGES

(Quickly Interchangeable)

Protect against Dusts, Gases and Vapors WITH THE AO R2000 RESPIRATOR

When a variety of hazardous vapors, gases or dusts are a problem, you can now simplify the protection and save money by standardizing on the AO R2000 Respirator. Its single, basic face piece accommodates four chemical cartridges of NON-SPARKING metal and three dust cartridges which, while light in weight for comfort, have maximum filtering capacity. CARTRIDGES INTERCHANGE WITH A TWIST OF THE WRIST—one twist removes outer cover, a second replaces it. Respirator may also be used with highly efficient, chemically-treated disposable dust filter.

Your nearest AO Safety Products
Representative can supply you



•WITH R31 CARTRIDGE — For low concentration of light organic vapors and gases in paint spraying, degreasing, dry cleaning, cementing, etc. Absorbs vapors of benzene, xylene, toluene, gasoline, naphtha, acetone, turpentine, etc.



•WITH R32 CARTRIDGE — For low concentrations of acid gases, mists—sulphuric acid, hydrogen chloride, etc. Used in plating, pickling operations and similar.



•WITH R33 CARTRIDGE — For low concentrations of combined acid and organic gases such as halogenated hydrocarbons, carbon tetrachloride, acetic acid. Protects in degreasing operations, etc.



•WITH R34 CARTRIDGE—Protects against nuisance concentrations of ammonia.



•WITH R15 CARTRIDGE — For nuisance and pneumoconiosis-producing dusts. (BM-2121)



•WITH R16 CARTRIDGE — For toxic dusts not significantly more harmful than lead. (BM-2138)



•WITH R17 CARTRIDGE—For all dusts not significantly more toxic than lead. (BM-2138)



RESPIRATORY PROTECTION

QUICK RESPIRATOR FACTS

- Face mask molded from pliable rubber.
- 1/2" rubber headband.
- Inhalation valve of pure gum rubber freely admits air at lightest intake of breath, seals tightly on exhalation.
- Exhalation valve cannot stick, completely expels air—moisture cannot collect, dust cannot enter.
- Disassembly for cleaning is easy without special tools.

American Optical
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

When inquiring check CP 5919 on handy form, pgs. 2-3

frequency synthesis analysis simplified...

The Sine Wave Generator is designed as a convenient tool to determine transfer functions of components in automatic control systems and to define the physical properties of existing plants to which control systems are to be added. Data is acquired by the frequency synthesis method in which sinusoidal forcing functions are applied to the system and measurements taken of amplitude and phase shift of the output response. For further information on this or other special purpose devices, or assistance in solving your particular computing-controlling problems, consult LIBRASCOPE.

$$\frac{1}{s(s+T)}$$

$$\alpha \left[\frac{1+Ts}{1+\alpha Ts} \right]$$



$x = A \sin 2\pi ft + B$

THE SINE WAVE GENERATOR
Especially adaptable to pneumatic devices in industrial control systems. It generates sinusoidal motion of adjustable frequency, amplitude and mean position and provides auxiliary electrical signals for phase reference.

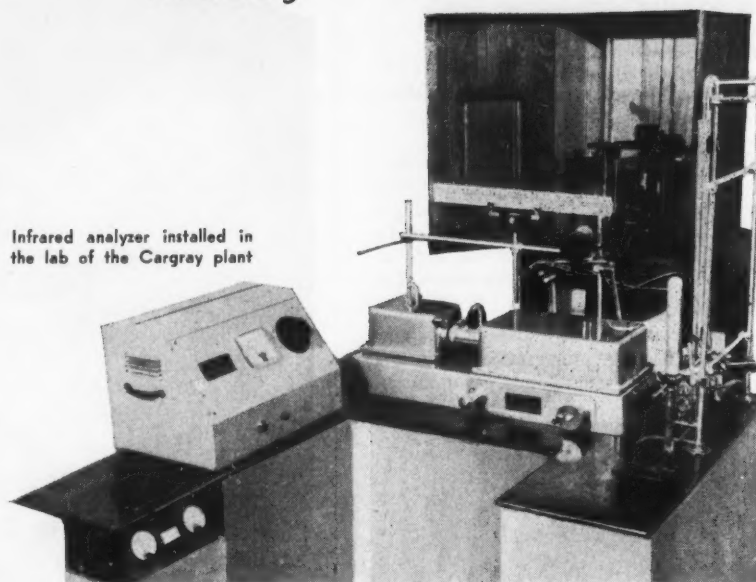
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A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

Engineers, physicists and mathematicians in search of interesting assignments, rapid advancement, and job security are requested to write Dick Hastings, Personnel Director.

When inquiring check CP 5920 on handy form, pgs. 2-3

for the
laboratory

Infrared analyzer installed in the lab of the Cargray plant



infrared IS practical in a small refinery

**Two years of service show:
high accuracy
tests in one-tenth former time
lab personnel cut in half**

A report from the Cargray Plant of the Panoma Corporation in White Deer, Texas throws light on the current discussion of whether infrared analysis is economical in a small refinery producing natural gasoline and liquefied petroleum products. At the Cargray Plant, throughput is about 110,000,000 cu ft of natural gas each 24 hours. An infrared spectrometer has been in service there for more than two years and has proved its usefulness.

Compared with standard laboratory methods, it has been found to be more accurate, a considerable time saver, and a great labor saver.

Main application of the instrument is in analysis bearing on control tests. It has also been used to determine purity of hydrocarbon products. About 90% of the analyses

were made on three component mixtures. Remaining 10% covered two, and four-component mixtures. It was found that after proper infrared measurements had been made, concentrations could be easily determined by algebraic methods and slide rule calculations. Time per analysis was cut to one-tenth that of previous method, fractional distillation. Laboratory personnel has been reduced by 50%. Laboratory technician now has ample time to obtain hydrocarbon samples for analysis as well as time to carry out other assignments.

Analyses made on instrument serve as checks on hydrocarbons generally sold by natural gasoline refineries. Composition of natural gasoline blends can be determined and from the analysis vapor pressures and specific gravities can be calculated. Method provides a quick and accurate substitute for Reid and LPG vapor pressure methods. It also can substitute for API gravity method. At present, method is not an acceptable substitute for ASTM method — though there is a possibility that it will be when usage becomes more general.

Infrared analysis method has been important

in bringing about considerable improvement in operating efficiency. Improvement resulted from a program of periodic analyses conducted on a routine basis in the laboratory. These tests were supplemented by routine tests in the plant by operating personnel.

An example of the procedure is the case where analyst and plant operator take samples of the same kind from a fractionating column. While operators run weathering and boil-away tests, analyst is carrying out infrared analysis. When results of the analysis are tabulated and compared with initial and final boiling points determined in the weathering and boil-away tests, operator is able to see more clearly how efficiently fractionator is operating. This also enables him to judge just what his operating objectives are. These joint tests also serve to encourage operator to maintain high operating standards.

Tabulated charts have been devised for use with the weathering and boil-away tests. These represent the work of detailed analyses. From the charts, operator can determine endpoint he should obtain from such tests at atmospheric pressure in order to produce a product of given purity.

Infrared has been found to be especially useful when a large number of samples have to be analyzed in a minimum of time. A typical application is in finding temperature gradient through a fractionating column. Information obtained by infrared method allowed operators to quickly locate proper tray in the column in which to place a temperature control element.

Cost per analysis has been considerably less than that for analysis by fractional distillation. Even instrument maintenance costs have been lower. Chief Chemist Paul T. Buchanan says, "There is no question in our minds that infrared analysis has been beneficial both economically and from the standpoint of plant operation efficiency."

(Infrared instrument was manufactured by Perkin-Elmer Corp., Dept. CP, Norwalk, Conn. . . . or for more information check CP 5921 on handy form, pages 2 and 3.)

Versatile analytical balance actually two units in one

Incorporating a projection system for added convenience, analytical balance offers advantages of a dual sensitivity device which makes it equivalent to two separate instruments. Shifting a lever to an alternative position converts the balance, which normally reads directly to 1/10th mg. to a system which is able to give readings directly to 1/100th mg.

Specifications, features of design, and principle of operation of the balance are outlined in 6-page bulletin. Numerous photographs and drawings serve to illustrate unit's advantages.

Bul 27 is issued by Volland & Sons, Inc., Dept. CP, 32 Relyea Pl., New Rochelle, N. Y. When inquiring specify CP 5922 on handy form, pages 2 and 3.

"PYRODISC"

THE NEW LINDBERG HOT PLATE

At last! A quality, portable hot plate... the Lindberg Pyrodisc!

Easily moved with one hand!

Ideal as an auxiliary hot plate for specific job not requiring large capacity, or for the occasional user. And its selling price is only \$25.00.

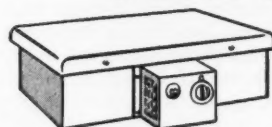
- Cast-in elements.
- "Stepless" control permits extremely precise control of temperatures.
- Terminals are protected from spillage and short circuits.

Diameter, top plate and base, 8"; power rating, 660 watts; power service, 115 volts, 50/60 cycle. Includes cord and plug for easy installation. Shipping weight, 10 lbs.

H-28640—Pyrodisc... Each \$25.00



If you require large capacity LINDBERG HOT PLATES Check this list and



Order now!

LINDBERG HOT PLATES perform varied and routine laboratory jobs, such as boiling, evaporations, and heating. Working temperatures range from 150°F (65°C) to 950°F (510°C). One of the outstanding features of these hot plates is the facility with which the plate temperatures may be raised or lowered to any degree of heat, within the rated temperature range, by means of the Lindberg Input Control.

CHECK LIST	H-28650			H-28655
	H-1	H-2	H-3	H-5
Unit Number				
Plate Working Surface	10" x 12"	12" x 20"	12" x 30"	5" x 22"
Overall Length A	12 1/4"	20 1/4"	30 1/4"	22 1/4"
Overall Width B	12 1/4"	14 1/4"	14 1/4"	9"
Hot Plate Width C	10 1/4"	12 1/4"	12 1/4"	5 1/4"
Overall Height D	6"	6"	6"	6"
Power Rating (Watts)	1300	2600	3900	1300
Power Service	115-230V 60Cy	115-230V 60Cy	230V- 60Cy	115-230V 60Cy
Shipping Weight	35 lbs.	55 lbs.	115 lbs.	55 lbs.
Price	\$75.00	\$95.00	\$126.00	\$83.00

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When inquiring check CP 5923 on handy form, pgs. 2-3

Get your name on the list to receive FILTER FACTS

● Shriver "Filter Facts" contains useful information for the user of filtration and fluids-handling equipment.

The current issue includes articles on selection of filter media; drying of filter cakes; electrolytic regeneration of sour "gas" caustic scrubbing solution; wax cooling; filtering brewer's mash; pumping velocities and impending clogging in fast-settling slurries; and other interesting practical items.

Write us for the current issue of "Filter Facts" and others to come.



T. SHRIVER & CO., Inc. 846 Hamilton St. • Harrison, N. J.
Filter Presses • Filter Media • Diaphragm Pumps

When inquiring check CP 5924 on handy form, pgs. 2-3

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When inquiring check CP 5925 on handy form, pgs. 2-3

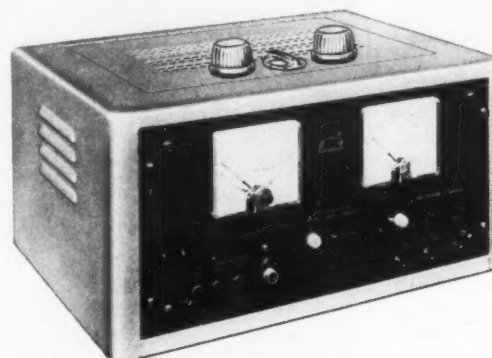
FOR THE LABORATORY

Three built-in circuits permit use of ratemeter for variety of useful applications . . .

suitable for both laboratory and control uses

Uses: Laboratory monitoring, half life studies, process control and similar applications.

Features: Output changes less than 0.5% when line voltage varies from 100 to 130 v. Both filament and plate supply are regulated. No drift occurs due to tube or component aging.



Operates as alarm, control, or graphically records in radioactivity applications

Description: Precision counting ratemeter with built-in circuits for alarm, control, and graphic recording can be operated by a Geiger Mueller tube connected directly to the input or by any device producing similar pulses. Unit is available in ranges of 0-2000, 0-10,000, and 0-20,000. Panel lights indicate range the unit is operating on at a particular time. Instrument will shift ranges up or down automatically, and range can also be shifted manually for operation in a particular region.

(Ratemeter-Alarm-Control, Model RAC-11 is manufactured by Nuclear Measurements Corp., Dept. CP, 2460 Arlington Ave., Indianapolis 18, Ind. . . . or for more information check CP 5926 on handy form, pages two and three.)

Determination of carbon in NaK alloy employed as heat transfer medium helps locate, prevent corrosion . . .

alloy is used extensively in atomic power work

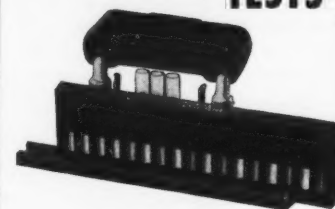
Certain alloys have been shown to carburize to an appreciable depth when allowed to remain in contact with sodium-potassium alloy to which carbon has been added. Carburization of alloys used in construction weakens these materials, especially under impact loads. Since sodium-potassium alloy is a liquid metal being studied for use in atomic power plants as a heat transfer medium, it was necessary to develop a method for determining the total carbon

"couldn't do
without my



TAYLOR COMPARATOR

for pH, CHLORINE
TESTS"



That's what chemists and engineers say in plants all over the country . . . because Taylor Comparators give you fast, easy determinations of pH, chlorine, phosphate, as well as complete water analysis. And you can make these determinations anywhere in the plant! No need to carry solution samples back to the lab since your Taylor set is lightweight, small, and no trouble at all to carry with you.

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There's no chance of mechanical inaccuracy because all Taylor Liquid Color Standards carry an unlimited guarantee against fading!

EASY TO USE

Taylor Comparators use the familiar colorimetric method of comparison, but without the need for fragile, single Nessler tubes. All color standards for a single determination are housed in a sturdy plastic slide. Many different slides may be used on the same base.

GET THE FULL STORY from your lab supply dealer or write for free book, "Modern pH and Chlorine Control". Gives theory and application of pH and Chlorine control, illustrates and describes full line of Taylor Comparators.



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YORK & RODGERS FORGE BLDG. - BALTIMORE, MD.

When inquiring check CP 5927 on handy form, pgs. 2-3

CHEMICAL PROCESSING

FOR THE LABORATORY

content of the liquid alloy before it was used for filling an industrial system. The results of these determinations were then used in conjunction with those from subsequent analyses of the material while in use to ascertain the effect of the alloy on the particular system in which it was being used.

The procedure which has been developed for this determination is a modification of the classical micro-combustion method and consists of carefully burning a sample of sodium-potassium alloy in an atmosphere of pure oxygen. This converts all of the carbon present to carbon dioxide, which is then absorbed and weighed. While the combustion itself is not too unlike a comparatively familiar procedure, there were problems involved in developing proper methods for sampling hot NaK from a dynamic system, weighing it, and transferring it to the analytical apparatus — all of which required special equipment.

Reactivity of the sample when exposed to the atmosphere, regulation of oxygen flow through the combustion tube, extension of ignition time, increase in final ignition temperature, disposition of other possible combustion products such as nitrates, and complete absorption of CO_2 were factors which were considered in the development of the analytical method. In addition, the combustion tube and other parts of the apparatus get more severe usage than do conventional combustion trains.

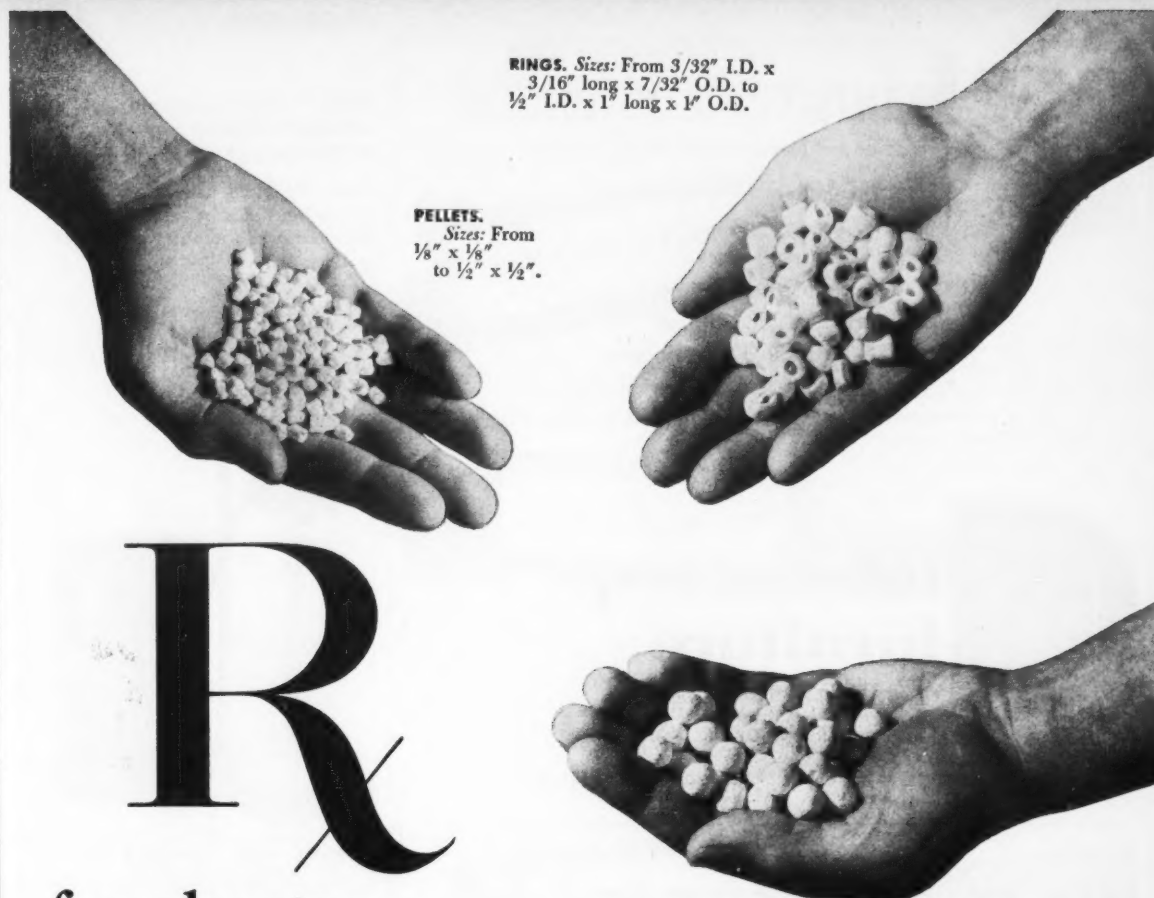
Although similar in design to conventional combustion tubes, the tube employed in the combustion train for this analysis has an enlarged combustion chamber. This allows larger sample boats to be accommodated. The tube is fabricated of quartz, and an expendable quartz sleeve is used during the analysis to protect the combustion tube.

A specially-designed sample introduction chamber is employed at the enlarged end of the combustion tube to introduce NaK samples into the tube without exposure to the atmosphere. This unit permits introduction of samples in sample boats or in ampules.

In order to sample hot NaK from dynamic systems and maintain the sample in proper condition for analysis, another special unit was fabricated. This apparatus permits the entire sample to be used for analysis (the analytically correct procedure) and allows the sample to be taken hot. This procedure eliminates the segregation and precipitation of suspended and dissolved materials which occur upon cooling of the sample. The sample is directed into the sample boat without exposure to the atmosphere and weighed while in the sampling apparatus.

While special techniques and apparatus are required for sampling and actual analysis, the data obtained are of great value in interpreting results of other studies such as corrosion, carbon migration and others related to the effect of sodium-potassium alloy on container materials. It is believed that hydrogen content can also be determined simultaneously.

(Method for the determination of carbon content of the liquid metal, including special apparatus and techniques involved, is outlined in "Determination of Carbon in Sodium-Potassium Alloy," presented by members of the staff at the Research Center of The Babcock & Wilcox Co. in Alliance, Ohio, at a meeting of the American Chemical Society.)



RINGS. Sizes: From $\frac{3}{32}$ " I.D. x $\frac{3}{16}$ " long x $\frac{7}{32}$ " O.D. to $\frac{1}{2}$ " I.D. x 1" long x 1" O.D.

PELLETS. Sizes: From $\frac{1}{8}$ " x $\frac{1}{8}$ " to $\frac{1}{2}$ " x $\frac{1}{2}$ ".

SPHERES. Diameters: $\frac{1}{4}$ " to 1".

R

for shorter
contact time!

Norton specially engineered carriers bring proved advantages to a wide range of processes

Whatever your specific application may be, it will pay you to investigate the many advantages of Norton catalyst carriers.

Made of ALUNDUM* (fused alpha alumina), these highly refractory carriers are outstanding for heat conductivity, chemical inertness, mechanical strength and abrasion-resistance. And Norton's exclusive *controlled structure* process offers you a choice of porosities. In pellets and rings, porosities range from medium to high. In spheres, porosities range from medium, with rough exterior for coating with catalyst... to high, with a network of open pores and rough exterior for impregnating with catalyst.

Chemical engineers are finding this Norton "Special Refractory Prescription" invaluable in processing many different products. For example, in meeting the rapidly growing demand for phthalic anhydride, Norton catalyst carriers aid

in shortening catalyst contact time and in achieving the highly exothermic reaction in fixed bed converters.

Test Them Out

Find out just what Norton ALUNDUM

catalyst carriers can do for you. See your Norton Representative for samples, or write to NORTON COMPANY, 560 New Bond Street, Worcester 6, Mass.

Canadian Representative: A. P. Green Fire Brick Co., Ltd., Toronto, Ontario.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

NORTON

REFRACTORIES

ENGINEERED **R** PRESCRIBED

Making better products... to make other products better

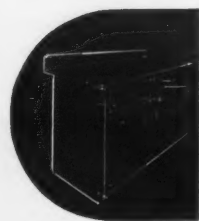
NORTON COMPANY, WORCESTER 6, MASSACHUSETTS

When inquiring check CP 5928 on handy form, pgs. 2-3

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to create and pioneer Steel Laboratory Furniture with:

- Unitized Sectional Construction
- Lock Joint Construction
- Micro Levelling Devices
- Split Reagent Shelf Supports
- Chemical Resistant Enamel
- "Labflex" Patented Construction
- "Pipemaster" Patented Service Racks
- "Labmaster" Design Patented Service Fixtures



Write for Catalog

laboratory furniture

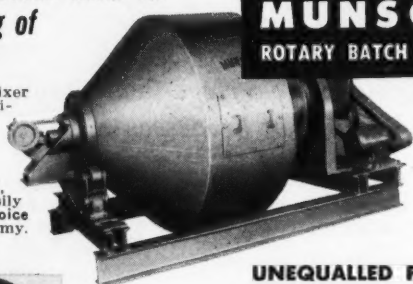
COMPANY INC.

Old Country Road, Mineola, N.Y.

When inquiring check CP 5929 on handy form, pgs. 2-3

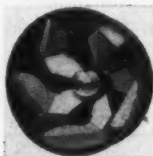
MIX IT *better* ... MIX IT *faster* ... the TUMBLING ACTION mixer for intimate blending of dry ingredients

A Munson Rotary Batch Mixer provides faster, more intimate blending of dry ingredients — yet will not stratify ingredients or alter characteristics of basic components. Its famous 7-way mixing action, plus low operating costs easily makes the Munson first choice for performance and economy.



MUNSON
ROTARY BATCH MIXER

**EXCLUSIVE
MULTIPLE-
BLENDING
ACTION!**



Lifters continuously cut out and lift ingredients as drum slowly revolves. Rotating cone tumbles stock to center. Conveyor flights on mixer shaft also agitate stock back to center — where mixing cycle repeats. Empties completely after every mix.

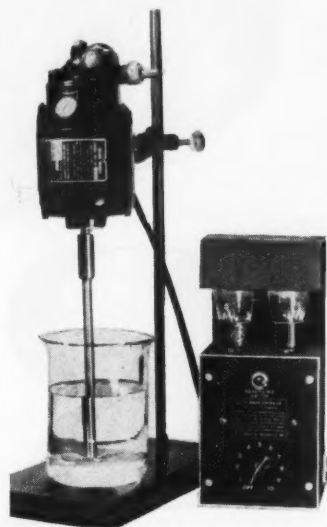
MUNSON MILL MACHINERY CO. Dept. P-154 Utica, New York

When inquiring check CP 5930 on handy form, pgs. 2-3

LABORATORY

Mixer offers variable, reversible speed at full torque

Uses: Provides laboratories with advantages of controlled speed in DC motors operating from AC outlets.



Motor torque is constant over entire speed range

Features: Motor torque is constant over entire speed range. Increase of current requirement is automatically signalled to control. Instantaneous response guarantees constant torque.

Description: Mixer incorporates a special wound, enclosed, ball bearing unit with extended armature and gear shaft. Both ends of the shaft are usable either with chuck, mixing shafts, or three-step pulley.

Armature shaft speed from 0 to 5000 rpm can be run in either direction, by means of a reversing switch on the controller.

In addition to motor and control, mixer comes complete with a mounting bracket for attachment to ordinary laboratory support stand, two shafts with couplings to be attached to either motor shaft, a three jaw chuck with capacity from 0 to $\frac{3}{8}$ " with mounting arbor, three-step pulley to fit either shaft, and hollow head wrenches for the set screws in the various attachments.

(Model GT-21 Laboratory Mixer is a product of Gerald K. Heller

CUTTING COMPLAINTS



A pinch of dust or grit at your assembly line inspection bench or in the packing and shipping room can cause very expensive service calls later on. Spencer Vacuum is easily piped to each room and bench. It will speed production—save time in general cleaning and with special attachments, can collect water, pick up welding flux, reclaim materials and do 130 other jobs that are too expensive by hand. Ask for Bulletin No. 144.

THE SPENCER TURBINE COMPANY • HARTFORD 6, CONNECTICUT



When inquiring check CP 5931 on handy form, pgs. 2-3

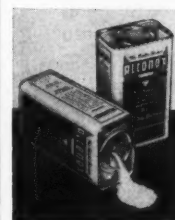
CLEAN

4 WAYS BETTER

—Easier
—Safer



at 2½ cents per gallon



Whether the job calls for cleaning metal, glass or plastic equipment Alconox combines power with the gentleness that spells "safely clean".

ALCONOX provides.....

1. Tremendous Wetting and Penetrating Action
2. Complete Solubility — leaves no film or residue
3. Efficiency under ANY water conditions
4. Versatility . . . a multiple cleaning Detergent — Safe for all purposes.

Write for literature, samples and name of nearest distributor.



When inquiring check CP 5932 on handy form, pgs. 2-3

CHEMICAL PROCESSING

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NECTICUT

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water condi-

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ENT

, pgs. 2-3

ESSING



EASY WAY TO FIGURE TUBING WEIGHTS

● This ELECTRUNITE Tubing Calculator can save you a lot of time. All you do is set the "O.D. minus one wall thickness" under the "wall thickness" scale. Then read the weight over the arrow.

It's packed with additional information on size-gage ranges for ELECTRUNITE Round Mechanical Tubing, both Carbon and Stainless; ELECTRUNITE Boiler Tubes; Heat Exchanger and Condenser tubing, Carbon and Stainless; and ELECTRUNITE Stainless Steel Pipe. It also has decimal equivalents. All the information you need . . . right at your finger tips . . . when you need it.

Get this Republic ELECTRUNITE Tubing Calculator today. It's yours . . . free for the asking. Just write to:



STEEL AND TUBES DIVISION
REPUBLIC STEEL CORPORATION
207 East 131st Street • Cleveland 8, Ohio

ELECTRUNITE TUBING

When inquiring check CP 5933 on handy form, pgs. 2-3

JANUARY, 1954

LABORATORY

Co., Dept. CP, Ridgeley and Worcester Sts., Baltimore 30, Md. . . . or for more information check CP 5934 on handy form, pages 2 and 3.)

Stereo microscope offers greater versatility for inspection work

Uses: Practical for examination and inspection of small parts, small objects; for inspection of machined surfaces, welds, stampings, chamfers, angles, threads, holes, etc; for detection of flaws and defects in manufactured parts; for assembly of small components.

Features: Through stereoscopic viewing excellent depth is available together with the magnification. Prism erecting system gives an image that is right-side up and correct as to left and right.

Description: Two sets of paired objectives, 3 and 5X, are furnished with the microscope to give user a power range from 15 to 60X. Objectives are easily changed—sliding in and out on machined surfaces.

(Edscorp Stereo Microscope is manufactured by Edmund Scientific Corp., Dept. CP, 301 E. Gloucester Pike, Barrington, N. J. . . . or for more information check CP 5935 on handy form, pages 2 and 3.)

Introduce aerosol sprays for use in laboratories

Available in two formulas, one a germicidal deodorant and the other an insecticide, aerosol sprays have been marketed for use in the laboratory. Formula No. 211, a germicidal deodorant, has a pleasant odor which is not heavy in character. It aids in the reduction of airborne bacteria. Formula No. 215, a destructive laboratory insecticide, also has a comparatively pleasant odor and lasting effectiveness.

(Royalton Glad-Air aerosol sprays are distributed by Meyer Scientific Supply Co., Inc., Dept. CP, 215 N. 8th St., Brooklyn 11, N. Y. . . . or for more information check CP 5936 on handy form, pages 2 & 3.)

ACRAWAX C—SYNTHETIC WAX

High Melting Point

M. P. of 140-143 °C. (280-290 °F.).
When incorporated with other materials, it raises melting point of blends and reduces "cold flow" markedly. For adhesives, asphalt, electrical insulation, other heat applications.

Lubricant

Integral lubricant and detackifier for vinyls, phenolics, polystyrene, rubber. Dry drawing stainless steel wire.

Water Insoluble

Insoluble in water and practically insoluble in all solvents in the cold. Increases water repellency, acid, salt spray and solvent resistance of many substances, including rubber, resins, paints and coating materials.

In addition to synthetic waxes and a complete line of nonionic esters, Glyco is now producing the Tetrines—ethylenediamine tetraacetic acid and salts—for controlling di- and tri-valent metallic ion contaminants in processes using water.

The Tetrines, organic chelating, sequestering and complexing agents, have wide application in the agricultural, cosmetic, detergent, latex, leather, pulp and paper, and textile industries, among others.

Send for our catalogs "The Tetrines," and "Waxes by Glyco."



GLYCO PRODUCTS CO., INC.

26F Court Street

Brooklyn 1, New York

When inquiring check CP 5937 on handy form, pgs. 2-3

Try Woven GLASS FILTER CLOTH. for

STRONG ACID SOLUTIONS

OXIDIZING SOLUTIONS

at HIGH temperatures

NFM Woven Glass Filter is as chemically resistant as chemical glass itself! It will withstand extremely high operating temperatures and is completely resistant to hot acids and hot oxidizing solutions of all types.

NFM Woven Glass Filter Cloth may well be the answer to your TOUGH filtration problem. Available in roll quantities in widths from 26" to 68" (100 linear yards or more) or in any length in the standard 38" width. Twill, chain and plain weaves. May we send you a pilot test sample?

If you want the cloth made up into filter element covers, anode bags, dust collector bags, etc., we are in position to do this at nominal cost . . . considerably less cost than when they are prepared in your plant. They'll be "all glass", too. We use glass thread for sewing.



NFM Weavers of Industrial Filter Media for over Forty Years
The National Filter Media Corp.

General Offices & Mills: New Haven 14, Conn.
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When inquiring check CP 5938 on handy form, pgs. 2-3

LABORATORY

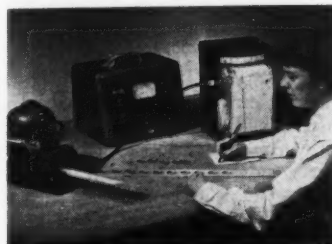
**"Hot" chromatography
employs recording
counter . . .**

paper strip's radioactivity
echoed by count-rate record

Uses: Laboratory instrument allows paper chromatography methods to be employed with radioactive substances. No stains, indicators, or optical methods need be used.

Features: Instrument provides chart record which matches paper strip inch by inch and shows intensity of radioactivity at each point.

Description: Automatic system for exploring distributed radioactivity on paper radiochromatogram employs a thin-window



Strip chart recorder is synchronized with paper strip through counter

Geiger counter. In operation system locates and estimates (quantitatively) components separated on chromatogram by scanning paper strip.

System consists of strip feeder, lead shield which contains mica-end window counter, and a collimating slit. Analytical count rate meter and strip-chart recorder are also used. Paper strip is taped to metal backing and passed through lead shield and through rollers of strip feeder. Movement of paper strip is synchronized with movement of recording chart so that direct comparison may be made after chart has been scanned. Rate of progress of both chart and strip may be set to one of eight different speeds from 0.75 to 360" per hour.

("Actigraph" is a product of Nuclear-Chicago, Dept. CP, 229 W. Erie St., Chicago 10, Ill. . . or for more information check CP 5939 on handy form, pages 2 and 3.)

ENGINEERING FIRMS SAY "IDEAL FOR OUR JOB or OFFICE NEEDS"



9WH33A

MORE AND MORE BUSINESSMEN USE . . .

**WHEELER SOUND POWERED
Electric TELEPHONES**

- NO BATTERIES. No outside power.
- LOW in FIRST and LAST COST.
- ALWAYS READY IN EMERGENCY.
- UP TO 12 stations intercom.
- Corrosion-resistant construction.

ASK ABOUT NEW EXECUTIVE-TYPE CRADLE PHONE.

THE **WHEELER INSULATED WIRE CO., INC.**

Division of The Sperry Corporation

1112 EAST AURORA STREET • WATERBURY 20, CONNECTICUT

When inquiring check CP 5940 on handy form, pgs. 2-3

**1000 GALLONS
DEIONIZED WATER 18c***
(equivalent to distilled water)
*Based on 10 grain water

Elgin Ultra-Deionizer

Mineral impurities in water used for processing can cost a lot of money in rejects and inferior product quality. Objectionable spots on product surfaces following rinsing and drying is one example. Unwanted minerals left in chemicals and pharmaceuticals is another. Troubles encountered in countless processes can be traced directly to the mineral impurities in water.

The Elgin Ultra-Deionizer will eliminate such water troubles at a cost any plant can afford. It will produce large quantities of mineral-free water, of even higher quality than that obtained by distillation or evaporation — and at a mere fraction of the cost. Being a compact, simple-to-operate unit containing a mixture of cation and anion exchanging resins in a single tank it is low in investment and operating costs. That's why plants using two and four column demineralizers are replacing such equipment with the dependable new Elgin Ultra-Deionizer.

Let us have our nearest representative show you how it can eliminate rejects and improve product quality in your plant — or ask for Bulletin 512.

Write today for complete data

ELGIN - REFINITE

Division of

Elgin Softener Corporation
180 N. Grove Avenue, Elgin, Illinois

When inquiring check CP 5941 on handy form, pgs. 2-3

FOR THE LABORATORY

**Lab goes where needed
— it's on wheels . . .**

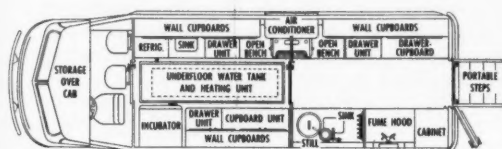
eighteen feet long, it has all the conveniences of regular laboratory building



Basic unit is a truck with 199" wheel base

The laboratory on wheels is being built for a variety of uses. Basic unit is built in a Chevrolet truck chassis with a 199" wheel base. All metal body is insulated and provided with air conditioning and heating. Laboratory services are available including 7000 watts of electric power.

Several workers can use the 18' long laboratory at the same time. Aisle, 34" wide, is lined with work benches and cabinets on both sides. Standard lab-



Plan drawing of lab floor shows one typical setup

oratory furniture units can be installed without modification.

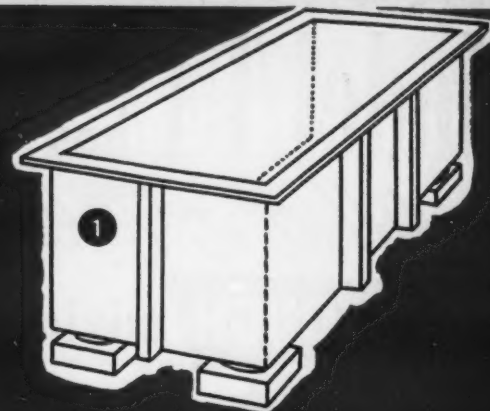
(Mobilab has been developed by Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . . or for more information reader may simply check CP 5942 on handy Reader Service slip located between pages 2 and 3.)

Presents the spectrophotometry story, slanting it toward the executive

Informative, 16-page booklet tells in readable "layman's" language what a spectrophotometer is, how it works and what to look for in selecting an instrument for any of countless industrial and laboratory uses. Numerous case histories, diagrams and other illustrations serve to show and illustrate both the advantages and theory of practical instrument design.

Bul 295-11 is issued by Beckman Instruments, Inc., Dept. CP, 820 S. Mission St., South Pasadena, Calif. When inquiring specify CP 5943 on handy form, pages 2 and 3.

Three Simple Steps for **LOWER** Tank Maintenance **COSTS**



Whether you line your tanks with rubber, plastic, brick, tile, lead or use them unlined, here are three simple steps you can take that will assure you longer tank life, lower maintenance costs:

1. Wherever possible see that tanks are installed with adequate air space underneath, and that all exterior surfaces are accessible for cleaning.
2. Coat all exterior surfaces, including the bottom, with Tygon Corrosion-resistant Paint — the all-plastic coating resistant to acids, alkalis, oil, water and alcohols. Don't be stingy. Do the job properly. Apply a coat of Tygorust, the "no-prep" rust inhibiting vinyl primer, and three coats of Tygon Paint.
3. Clean and inspect the outside shell occasionally. The glossy Tygon surface cleans easily. If you find a scratch or break in the film caused by carelessness, touch it up with fresh Tygon Paint. The job will be as good as new.

Wherever you have wood, metal or concrete surfaces exposed to the corrosive fumes, gases or spillage — protect them with Tygon Plastic Paint coatings. You'll lengthen the time between recoatings 50% to 500%. And Tygon Paint costs no more than coatings that offer less than half the life.

Tygon plastic paint coatings are pure plastic in a solvent vehicle. Applied cold by spray gun or brush, they dry to form a tough plastic film, resistant to the attack of acids, alkalis, oils, alcohols or water.

Tygon Paint films bond tightly to metal, wood or concrete. They do not oxidize, show no chemical deterioration with age. Tygon Paint films are flexible and tough; resist impact without chipping or flaking.

Tygon Paint films are non-flammable when dry, possess excellent dielectric strength.


U. S. STONEWARE
Akron 9, Ohio

When inquiring check CP 5944 on handy form, pgs. 2-3

Model TA has *What it Takes* to do **TOUGH** mixing

DESIGNED FOR

EXTRA HEAVY MIXING



AGITATOR
PARTS
QUICKLY
REMOVABLE
FOR EASY
CLEANING

GROEN

STAINLESS STEEL
STEAM JACKETED
TWIN-SHAFT
MIXER KETTLE

ASK US ABOUT
THE HIGH SPEED
ROTA-THERM
JACKET

Attains fastest cooking speed ever produced by any kettle! Multiple steam inlet design develops high velocity steam circulation instantly. No air pockets... no cool areas, possible. Gives all advantages of stainless steel plus swift operation. Ask for Bulletin RT-1.

IT'S A RUGGED, SANITARY UNIT

- Stainless steel from top to bottom. Completely sanitary — conforms to the most rigid Health Dept. requirements. Twin shaft operation for highest efficiency in mixing. Fully enclosed motor drives two shafts: (1)—at slow speed operating Flexible Finger-Like scrapers; and (2)—a secondary high-speed shaft equipped with any of a variety of beaters, blenders or mixers.

- Demountable shaft couplings permit entire agitator assembly to be removed in a few seconds for easy cleaning, and as quickly reinstalled. Cannot disengage in operation. And couplings equal strength of a solid shaft. Read all about this widely famous mixer in Bulletin TAK-2. Write for it now.

GROEN

MFG. CO.

4531 W. Armitage Ave., CHICAGO 39, ILL.

30 CHURCH ST.
NEW YORK 7

(HALF A CENTURY
OF FINE KETTLES)

7 FRONT STREET
SAN FRANCISCO 11

Expanding Chemical Production



Petrochem plant on Midwestern site gets facilities on-line

A \$50 million plant for production of hydrocarbons and industrial chemicals on a 500-acre site has been opened by the National Petro-Chemicals Corp. near Tuscola, Ill.

With an ethylene-producing unit capable of two million lb annually, and a synthetic alcohol unit (125,000, gpd 192-proof), the plant is owned 60 per cent by National Distillers Products Corp., which manages and operates it, and 40 per cent by Panhandle Eastern Pipe Line Company. Including two integrated plants of National Distillers U.S.I. Chemicals Division, the new complex comprises seven major producing units.

One of the two plants of National Distillers U.S.I. Chemicals Div. is a \$7 million unit to manufacture 50,000 tons of ammonia annually; the other is a \$2 million sulfuric acid plant. (More detailed information about the Tuscola plant is given on page 42.

New plant planned for plastics by eastern producer

Koppers Company, Inc. of Pittsburgh, Pa., recently announced construction plans for a plastics development plant at the site of the large Kobuta chemical plant. The new facilities will produce semi-commercial quantities of a wide variety of new plastics. The company is one of the nation's major producers of styrene and of polystyrene plastics.

Polystyrene production started from West Coast unit

Production of its brand of polystyrene is now underway at the new plant of Dow Chemical Company in Torrance, Calif.

Borden takes over American Polymer in chemical expansion move

Acquisition of the American Polymer Corp., Peabody, Mass., has been recently announced by the Chemical Div. of the Borden Company.

The acquisition includes American Polymer plants in Illiopolis, Ill., Montreal, Canada, and in Sao

Paolo, Brazil. All these plants produce resin emulsions and solutions of various types from a number of base monomers.

American Polymer will operate as a separate department of Borden's Chemical Division. Also announced by Borden was its recent opening of a new research laboratory in Philadelphia.

Reichhold plans \$10 million outlay for expansion program

Proposed expenditure of \$10 million for expansion and improvement of production facilities has been announced by Reichhold Chemicals, Inc. for all twelve of its domestic plants.

Inaugurating the program will be a \$3 million expansion of Reichhold's Tuscaloosa, Ala., plant for production of five million lb of pentaerythritol for the first time, and 30 million lb of formaldehyde. Other plant expansion plans will be announced later, Reichhold reports.

Brazil begins commercial output of phthalic anhydride

First commercial production of phthalic anhydride in Brazil has been announced by Industria Quimica Produtos Faticos. Present capacity from the firm's Mogi das Cruzes plant is 30 tons per month, with increased output planned to coincide with the start of production in the company's new phthalate plasticizer plant.

\$12 million lab for pharmaceuticals opened in Illinois

A \$12 million laboratory for producing ACTH, trypsin, insulin and other pharmaceuticals has been opened near Kankakee, Ill. by Armour Laboratories, Div. of Armour & Company.

Plan additional research facilities for pharmaceutical chemicals

Plans for a \$1.5 million research building for the Norwich Pharmacal Co. have recently been announced. The single story structure will be erected

When inquiring check CP 5945 on handy form, pgs. 2-3

adjacent to the firm's present chemical manufacturing plant north of Norwich, N. Y. Construction is expected to be completed by early November of next year. Control laboratories and the company's developmental laboratory will remain at the main plant in the same city.

Pharmaceuticals firm gets additional storage space, new branch office

Recent ceremonies marked the formal opening of American Cyanamid Company's Lederle Laboratories Division's new Portland, Ore., branch office. The new facilities, located at 3030 Northwest 29th Ave., provide warehousing and office space.

Battelle building new laboratory for chemical research

Construction has begun on a new \$1.4 million laboratory building to house chemical research at Battelle Institute, Columbus, Ohio.

The new building, Battelle's seventh major structure in Columbus, is slated for completion in the fall of 1954. Plans include provision for space for pilot plants used in chemical engineering research.

Plans doubling ammonia production to more than 300 tons daily

American Cyanamid Company is proceeding with plans to double present production capacity of anhydrous ammonia from its Fortier plant, near New Orleans, to more than 300 tons per day.

American Cyanamid gets Antibiotics Div. of Heyden Chemical Company

American Cyanamid Company is now controlling the Antibiotics Division of Heyden Chemical Company, in line with a sales agreement between the two company presidents late last fall.

Under the agreement, American Cyanamid has acquired the Heyden plant located at Princeton, N. J., and Heyden's patent rights and processes relating to manufacture of antibiotics.

\$35 million petrochem facilities begins operation in Texas

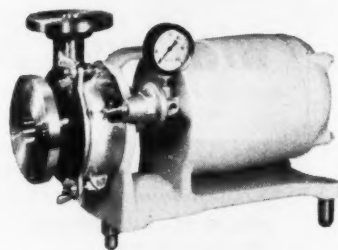
A series of new refining units, constructed at a cost of \$35 million and including a 50,000 bpd cat cracker for high-octane gasoline has been recently placed into operation at the Houston, Texas plant of Sinclair Refining Company.

Add longer life and greater economy

to your processing lines...



with
**TRI-CLOVER
WELDING
FITTINGS**



For top quality Centrifugal Pumps... be sure to investigate the many advantages offered through the use of Tri-Clover corrosion-resistant industrial pumps for an extremely wide range of applications. For complete details, write for new Catalog 253.

• Tri-Clover Butt Welding Fittings in Stainless Steel Type 304, 347, 316 and other analyses, are custom fabricated from highest quality materials by skilled craftsmen backed by years of specialized experience. Because of this quality, plus full corrosion resistance and longer life, the end result is greater economy in process line service.

Tri-Clover Zephyrweld® lightweight welding fittings are made in tube O.D. sizes from 1/2" through 24" and 36". Those through 4" are annealed, pickled and passivated. Larger sizes are annealed, and are passivated on request. Available in all standard fitting types.

Tri-Clover Schedule 5 and 10 welding fittings are made in a full line, for use with light gauge pipe in sizes from 1/2" through 24" and 36".

Schedule 40 welding fittings are available in sizes from 1/2" through 12". Information on request.

For stainless steel welding fittings for every process need, be sure to specify TRI-CLOVER.

See your nearest TRI-CLOVER DISTRIBUTOR

EXPORT DIVISION:
8 So. Michigan, CHICAGO, U.S.A.
Cable: TRICLO, CHICAGO

Tri-Clover®
MACHINE CO.
Kenosha, Wisconsin

TRI-ALLOY AND STAINLESS STEEL
SANITARY FITTINGS, VALVES,
PUMPS, TUBING, SPECIALTIES

FABRICATED STAINLESS STEEL
INDUSTRIAL FITTINGS AND
INDUSTRIAL PUMPS

THE Complete LINE

I-154

When inquiring check CP 5946 on handy form, pgs. 2-3



"MIGHTY MITE" SOLVES CHEMICAL PUMP PROBLEMS

The Eco All-Chem Pump is the All-Teflon and stainless steel pump that handles 70 percent of corrosive chemical requirements in Lab., pilot plant and small volume pumping in production service.

Simplify selection; standardize on fewer types, models, sizes; minimize maintenance problems.

READ THE SPECS . . . SPECIFY AND TRY

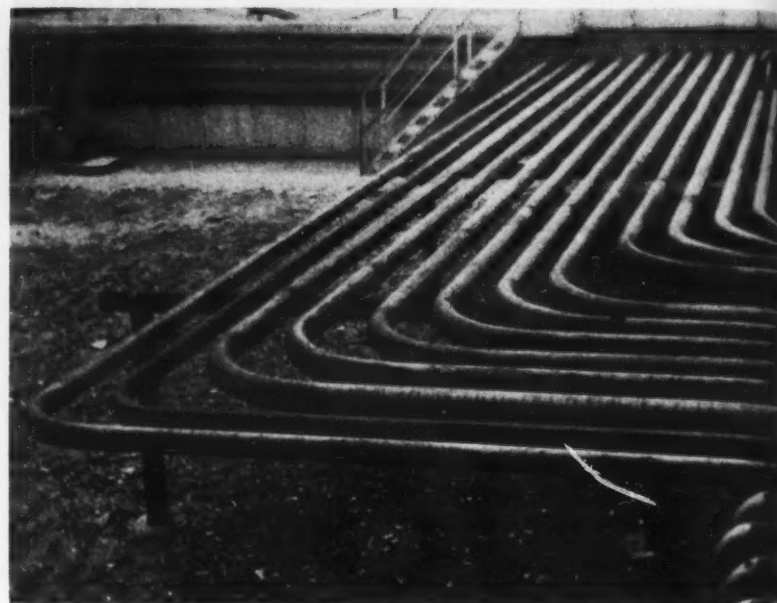
- **Type Pump:** Positive displacement with two opposed axially oscillating impellers equivalent to duplex piston operation.
- **Volume:** 1/2 to 10 g.p.m. at 1750 RPM (water).
- **Pressures and Temperatures:** Now up to 100 psi. and 212°F. due to improved impeller design and molding technique.
- **Suction Lift:** Highest over widest temperature and viscosity range.
- **Corrosion Resistance:** Lowest corrosion rate due to internal flow pattern.
- **Pump Operating Characteristics:** Linear delivery. No air entrainment. Non-foaming. Unequaled for safety in handling hazardous liquids such as nitric acid and hydrogen peroxide. Self-priming on non-volatile liquids.
- **Drive:** Applicable to direct motor drive at 1750 RPM, as well as to all other standard driving methods.



ENGINEERING COMPANY

12 New York Avenue • Newark 1 • New Jersey

When inquiring check CP 5947 on handy form, pgs. 2-3



Sweeping bends of 4" lines to four oil storage tanks offer unobstructed flow of foam for any fire emergency

cut costs at Wisconsin Petroleum with pipe benders

Saving of \$800 in materials and \$700 in labor results from bending piping for four large oil storage tanks

Problem: Contractor handling piping for four large oil storage tanks recently erected at Wisconsin Petroleum Terminals, Inc. on Jones Island in Milwaukee had a 90 day time limit for completion of 22,074 feet of piping involved in project. Most of work was concerned with connection of 3 and 4" lines for fire prevention extending from foam house to the four tanks. In addition to limited time available, it was necessary to install piping economically in order to stay within contract budget.

Solution: Instead of using welded fittings for bends in piping, most of in-

stallation was made with a One Shot Tal Pipe Bender. Unit consists of two main parts, hydraulic cylinder and frame, assembly taking less than one minute. Unit has a long ram, makes use of half circle shoes instead of short formers, and has a bend indicator. Bend can be made with single setting without moving pipe. Upon completion of bend, half circle shoes are removed from bender to free pipe.

Principal application of bender was on 10,020 ft of 4" pipe and 3983 ft of 3" pipe for the foam lines. Unit was also used on 1234 ft of 4" product line for loading tank cars and 380 ft of 2" product lines. In all, a total of 135 bends were made with 32 offsets.

Results: Use of pipe bender is estimated to have saved \$800 in materials plus 270 hours of labor, amounting to about \$700 additional savings. This is about a 75% saving in cost of materials and labor that would have been necessary with welded elbows. Following example

engineering and maintenance



These bent offsets, which would have required four fittings and eight welds, needed only a fraction of labor and materials necessary with welding

illustrates differences between welding and bending methods: a 90° 4" welded ell costs \$16 for material and two hours is required to fit and weld it, amounting to about \$5 for labor, or a total cost of \$21. Bend for same connection would cost only \$3. Material comes to \$1 and labor cost to \$2, with 45 minutes needed to set up and measure it, two minutes for bending.

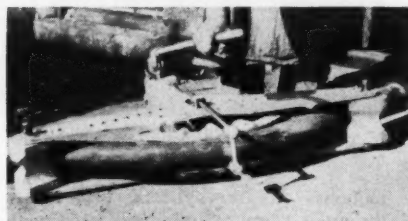


Bender has only two main parts, hydraulic cylinder and frame, which can be assembled in less than a minute with a U-key

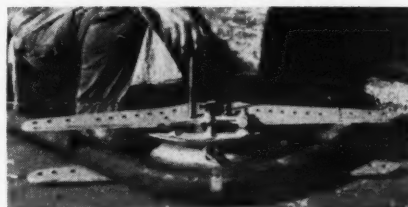
Ability of pipe bender to make offsets is one of the principal ways in which costs are cut. One bent offset alone eliminates two fittings and four welds besides taking only a fraction of the time.

In addition to saving materials and labor, contractors completed piping installation at Wisconsin Petroleum 10 days ahead of 90 day deadline. Another advantage obtained by bending pipe is that smooth inner walls allow flow with less resistance than welded ells. This also helps maintain line pressure. It is also evident from accompanying photographs that the wide sweeping bends have a streamlined effect that makes a maze of pipe attractive.

Contractor points out, however, that full advantages of bent pipe are realized only when bending is done at job site and when the proper benders are utilized. It is possible to buy pipe already bent but the cost for bending is about three times that what it would be if done on the job. Contractor's experience showed that with other pipe benders with short formers, it was necessary to move the pipe a number of times. Also more skill and time were required. It was found that with



A 45° bend can be made in a single setting without moving pipe



After bending, removal of half circle shoes frees pipe

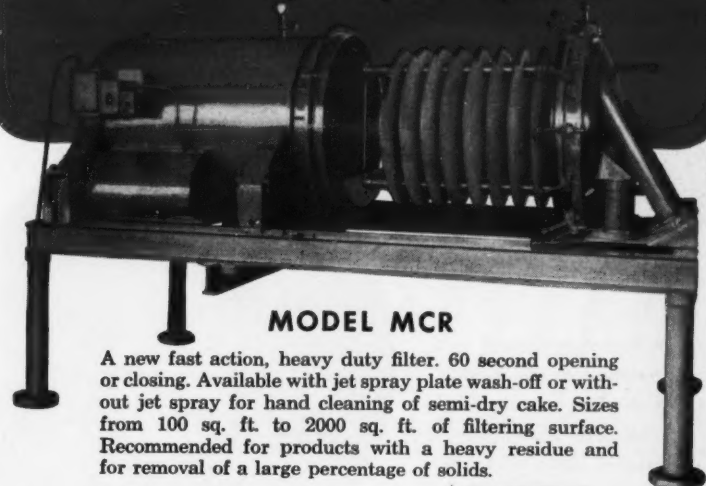
use of the one shot bender, bends could be made perfect fitting and identical with hardly any training.

(This article is based on an interview with Wilmer R. Schuh, Chief Engineer of the E. D. Wesley Co., plumbing and heating contractors in Milwaukee, Wis., the organization responsible for the piping installation at Wisconsin Petroleum.)

(One Shot Tal Pipe Bender is product of Tal Bender, Inc., Dept. CP, 417 N. Water St., Milwaukee 2, Wis. . . . or check CP 5948 on handy form, pages 2 and 3.)

FOR BOTH— HEAVY SOLIDS and FINE FILTRATION call on **SPARKLER**

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in filtration engineering and equipment.



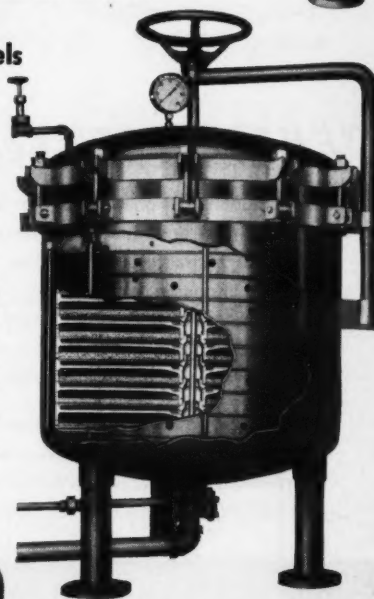
MODEL MCR

A new fast action, heavy duty filter. 60 second opening or closing. Available with jet spray plate wash-off or without jet spray for hand cleaning of semi-dry cake. Sizes from 100 sq. ft. to 2000 sq. ft. of filtering surface. Recommended for products with a heavy residue and for removal of a large percentage of solids.

Standard Horizontal Plate Models

For many years the accepted standard for fine filtering. Positive cake stability, no slipping or cracking, under any pressure variation or with complete shut-down of filtering, is an exclusive feature of the Sparkler horizontal plate filter that has earned a wide acceptance and use of this filter. Filter aids can be floated on the plate evenly at low pressure and fine sharp filtration obtained right from the start with a thin low density pre-coat. No other filter can match this performance. Available in plate capacities up to 150 sq. ft. of filtering surface. Tanks and plates available in a wide range of metals including Hastelloy, stainless steel, etc.

Write Mr. Eric Anderson for personal service on your filtering requirements.



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Service representatives in principal cities: • Sparkler Western Hemisphere Corp., Mundelein, Ill., U.S.A. • Sparkler International Ltd., Prinsengracht 876, Amsterdam, Holland • Kamitter & Co., 35 Chittaranjan Ave., Calcutta 12, India.

When inquiring check CP 5949 on handy form, pgs. 2-3



**It's in the RECORDS
at RCA**

- Record compound materials at this modern RCA plant are completely dispersed following the primary batch mixers by "ENTOLETER" Centrifugal Machines.

"ENTOLETER" Centrifugal Mixers

... compactly designed: Mixer has enclosed motor connected directly to specially designed high speed mixing rotor. Standard rotor consists of 2 steel discs spaced over 1" apart by exclusively designed impactors. Material is spouted into mixer and is directed by distributor to rotor center, where it is spun out by centrifugal force into thinning film as it approaches rotor perimeter. Uniform discharge through hopper to outlet.

Benefits are: Lower Cost . . . Better Quality . . . Compact Installation . . . Simplified Maintenance. May we send you additional information? ENTOLETER DIVISION, The Safety Car Heating and Lighting Company, Inc., 1197 Dixwell Ave., New Haven 4, Conn.

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HIGH SPEED MIXERS**

The trademark "ENTOLETER" is your guarantee of complete satisfaction

When inquiring check CP 5950 on handy form, pgs. 2-3

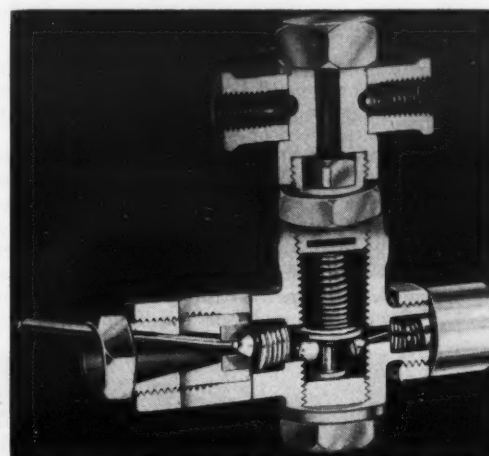
ENGINEERING & MAINTENANCE

Operating principle of air valve permits a greater freedom of pneumatic circuitry . . .

- wobble-rod construction enables unit to be actuated by all manner of motions

Uses: For use with pneumatically operated equipment.

Features: Lever which opens and closes valve is a hardened rod so swiveled that the free end can move vertically, laterally, diagonally, or in arcs and circles. Accordingly, valve can be actuated (manually, mechanically, or electrically) by all manner of



Valve will operate in any position

motions. It allows lateral play during a vertical throw; it permits direct linkage to rotating, oscillating, toggle, lever, slot, or straight thrust mechanisms. Unit can be adapted to cyclic operation by passing lever-rod through an eccentric hole in a rotating disc or gear; it is spring loaded to remain normally open rather than normally closed.

Unit's internal exhaust valve will automatically discharge an air cylinder, line or receiver when valve closes, but can be eliminated where it is desirable to hold air line pressures after valve has done its job. Another feature is check valve (ahead of ball-and-seat) to prevent backsurge.

Body casting is designed to permit two valves to be assembled into one unit. Such arrangements can provide common inlet, common outlet, simple series connection, or total independence of two valves. Thus, three-way, four-way, tandem, or synchronized operations can be served — through lever-rod linkage.

Description: Constructed of non-corrosive metals, valve is said to require no maintenance and have long life. Bronze, brass, and stainless steel are used throughout. There are no rubber or fiber seats or diaphragms. Mating parts are designed to seal without gaskets or packing, are threaded together with bolts or flanges. Dissimilar metals are used at friction points to prevent galling and reduce operating forces. Springs are of the compression type to insure safe operation in event of spring failure.



TAKE THE GUESSWORK OUT OF DUST PROBLEMS

Don't guess about the scope of your dust problem or collection equipment requirements when a simple test will



provide you with facts on every phase of your problem. Our new manual, "A Simplified Test Method for Dust Control Determination" describes this test method that will give you accurate facts on your dust problem, whether you are considering an initial

installation of dust control equipment or expanding an existing system. You'll find the complete information on this test and its effectiveness will prove profitable reading.

For your copy, just clip this ad to your company letterhead and sign your name and title.



When inquiring check CP 5951 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Versatility of installation is result of both right and left hand outlets ($\frac{1}{4}$ " IPS); a double-ended inlet ($\frac{1}{4}$ " IPS) which can be rotated and clamped through a full 360°; and a drilled and tapped flange for panel or bracket mounting.

Valve will operate in any position. It commonly serves as a pilot valve to actuate larger controls.

Range of usefulness is up to 125 psig. Open valve diameter is $\frac{1}{4}$ ". Overall dimensions are $3\frac{1}{8}$ x 5 x $4\frac{5}{8}$ " high. Weight is $2\frac{1}{4}$ lb.

(Wobble-rod air valve is a product of Pantex Mfg. Co., Dept. CP, 521 Roosevelt Ave., Pawtucket, R. I. . . or for more information check CP 5952 on handy form, pages 2 and 3.)

Double moisture absorption of predecessor offered by refrigerant desiccant

Uses: As a refrigerant desiccant, to remove water and acids from refrigeration systems.

Features: Desiccant is said to have nearly double the moisture absorption capacity of its predecessor. It not only removes water — drying Freon 12, for example, to less than 10 ppm at temperatures as high as 160°F — but also removes acids if present in system.

Description: Material, designated PA-400, is pre-attrited to give it superior non-dusting qualities. It is better than 99% inert, amorphous silica, which removes moisture by physical adsorption rather than chemical reaction and cannot itself dissolve in refrigerant or react in any way with oil.

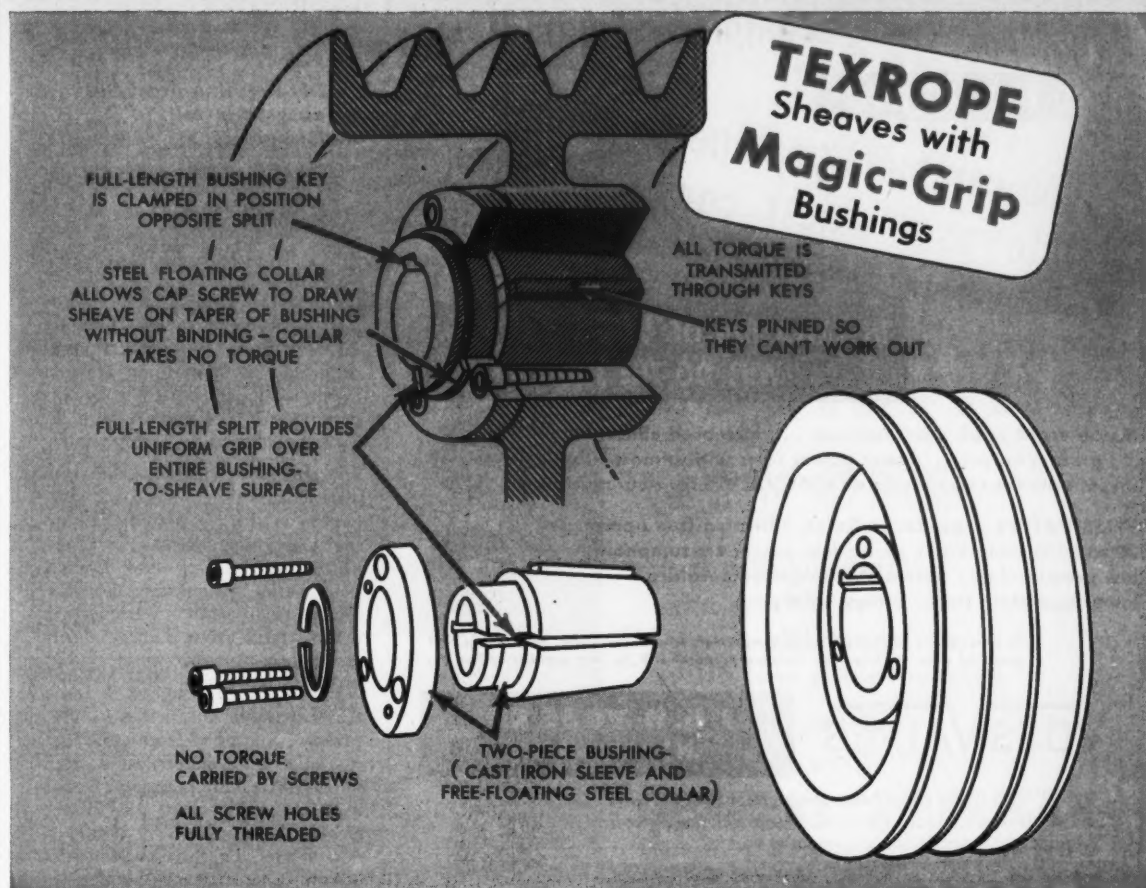
Desiccant has a particle size of 8-20 mesh. Irregular shape of particles promotes contact with refrigerant and consequent rapid drying. Having a density of about 49 lb/sq ft, it will enable use of small cartridges for insertion in refrigeration system.

(Refrigerant desiccant is a product of The Davison Chemical Corp., Dept. CP, 101 Charles St., Baltimore 3, Md. . . or for more information check CP 5953 on handy form, pages 2 and 3.)

Explains role of oxygen in combustion process

Bulletin illustrates how too much or too little air can have costly effect in combustion processes. It points out that by using oxygen itself as the criterion to proper combustion, greater overall process efficiency results. Bulletin also shows how oxygen in flue gases will indicate almost exactly the same excess air factor for any fuel from coke to natural gas, even when the fuels are in combinations of two or more. Sample point location is discussed and equipment requirements listed.

Bul AD-607 is issued by Arnold O. Beckman, Inc., Dept. CP, 1020 Mission St., South Pasadena, Calif. When inquiring specify CP 5954 on handy form, pages 2 and 3.



Get the Only Sheave with ALL the Most Needed Features

Here's Comparison of Magic-Grip Sheave and Other Sheaves

	Magic-Grip Sheaves	SHEAVE A	SHEAVE B	SHEAVE C
Bushing fully split for uniform clamping action.	Yes	Yes	No	Yes
Load carried by keys instead of threaded bolts.	Yes	No	No	No
Bushings cover full range of NEMA "probable" shaft diameters.	Yes	Yes	Yes	No
All screws engage full thread.	Yes	Yes	Yes	No
Mounts in one piece.	Yes	No	Yes	Yes
Squares itself with shaft.	Yes	No	No	No

Texrope and Magic-Grip are Allis-Chalmers trademarks.

ALLIS-CHALMERS

MILWAUKEE 1, WISCONSIN



When inquiring check CP 5955 on handy form, pgs. 2-3

A-4167

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CP 5951
2-3

ESSING

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DID YOU KNOW...

**you can build peak performance
into your oldest compressors!
and obviously into your newer, high speed machines, too!**

**INSTALLATION OF VOSS VALVES
WILL DO THE JOB!**

**if you want peak performance . . . increased efficiency
. . . greater output . . . lower power costs with utmost safety,
investigate the advantages of VOSS VALVES for your machines.**

**VOSS VALVES provide . . . Quiet, vibration-free operation •
20 to 60% more valve area • less power consumption •
low pressure loss • normal discharge temperature •
lower operating costs • utmost safety.**

To increase the efficiency of your compressor, send us the name, bore, stroke and speed of your machine. Our detailed proposal will be sent without obligation.

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INCORPORATED**

784-B East 144th Street, New York 54, N. Y.

When inquiring check CP 5956 on handy form, pgs. 2-3

for
• SPRAYING • WASHING • RINSING • COOLING • AIR
CONDITIONING

Get the most out of your Spraying Equipment with minimum power . . . with efficient spraying.

Use Yarway Nozzles. No internal vanes or other restrictions to clog or hinder flow. Two types—Yarway Involute-type producing a fine hollow spray with minimum energy loss, and Yarway Fan-type producing a flat fan-shaped spray with time-saving slicing action for cleaning.

Wide range of standard sizes and capacities. Cast or machined from solid bar stock.

Thousands in use. Write for Bulletin N-617.

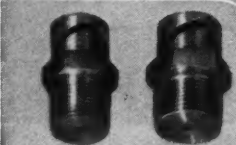
YARWAY SPRAY NOZZLES

YARNALL-WARING COMPANY
125 Mermaid Avenue, Philadelphia 18, Pa.

INVOLUTE-TYPE FOR HOLLOW CONE SPRAY



FAN-TYPE FOR FLAT SLICING SPRAY



When inquiring check CP 5957 on handy form, pgs. 2-3

MAINTENANCE

**Positive sealing provided
by easy-to-install
shaft seal . . .**

self-contained mechanical unit
requires less space

Uses: For a variety of shaft
sealing applications.

Features: Double-face cartridge
seal is designed to meet require-
ments of higher temperatures, pres-
sures, and rpm, according to manu-
facturer. It is reported to provide
more positive sealing, require less
space, and to be easier to install.

Description: Seal is one unit,
complete within itself, all parts
being contained in a compact hous-
ing cup. Installation is accom-
plished by pushing cartridge seal
onto shaft and tightening mounting
screws. Construction protects lapped
sealing faces from damage during
installation.

Stator rings are designed to insure
close hydraulic balance even when
pressure is applied from either side
of seal. Both stators act as indi-
vidual seals and both are flexible
members permitting axial move-
ment without unseating. Stators are
not affected by thermal expansion
of companion parts. Cavity between
stators contains a lubricant that pre-
vents the seal from overheating if
it runs dry.

O-ring, it is claimed, "floats" seal-
ing faces, protecting them from
shock and vibration. It is com-
pounded of materials for sealing
virtually any liquid or gas.

Washer-spring assures equal bal-
anced loading and provides con-
trolled spring pressures at specified
operating conditions. High tem-
peratures do not affect its spring
properties.

Micro-finished sealing faces are pre-
cision-lapped to within 10 mil-
lionths of an inch. These sealing
faces run against each other, elimi-
nating scored shafts and replace-
ments.

Rotor has two sealing faces lapped
flat and parallel. Rotor can be
made of various materials to meet
individual sealing requirements.

(Mechanical shaft seal is a product
of Cartriseal Corp., Dept. CP, 3515
W. Touhy Ave., Lincolnwood 45,
Ill. . . or for more information
check CP 5958 on the convenient
Reader Service slip located between
pages two and three.)

ACE-HIDE

**UNBREAKABLE
RUBBER-PLASTIC
3-GAL. PAIL**



3-GAL. PAIL



1-QUART
DIPPER

For handling corrosive solutions,
Tough, resilient, practically in-
destructible. Made of a new
synthetic rubber-base material
called ACE-HIDE, unaffected
by most acids and alkalis.
Drip-proof spout pours easily
directed stream. Graduated
scale inside pail. ORDER NOW
from your rubber goods dis-
tributor, or write us.

**ACE rubber and
plastic products**

AMERICAN HARD RUBBER COMPANY

93 Worth St., New York 13, N. Y.

When inquiring check CP 5959 on handy form, pgs. 2-3

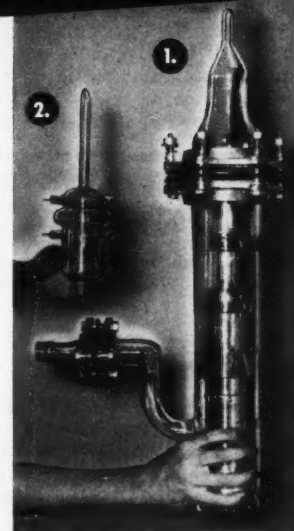
For High Vacuum Application . . .

1. HV-1 DIFFUSION PUMP

— a high speed oil-diffusion
type pump with an ultimate
vacuum of 4×10^{-7} mm. Hg.
designed for general service
including nuclear science, re-
search or material processing.
Among its features are 1)
Speeds up to 67 liters/sec-
ond, 2) Clear glass pump bar-
rel, 3) Simple maintenance,
4) No liquid cooling, charcoal
traps or mechanical wear.

2. 100-IG IONIZATION GAUGE

— a triode vacuum type ion-
ization gauge that will me-
asure pressure from approxi-
mately 10^{-3} mm. of mercury
to 10^{-8} of mercury. Its Nonex
glass can be sealed directly
to exhaust systems employing
Nonex or Kovar sealing glass,
and to Pyrex by means of a
graded seal. It has no in-
ternal insulators, and the en-



velope is designed to provide long leak-
age paths between the plate and other
tube elements.

Complete Data Sent on Request. Write:

EITEL-McCULLOUGH, INC.
SAN BRUNO • CALIFORNIA

Export Agents: Frazor & Hansen, 301 Clay St., S. F., Calif.

When inquiring check CP 5960 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Guide to selection of adhesives, coatings, and sealers

Handy 8-page bulletin lists most important adhesives, coatings, and sealers produced by company in such a way as to be a guide to selection of a specific material for a particular problem.

In the adhesives section, for example, photos and captions supplement tabular data and illustrate examples of fastening plywood to metal, cork to metal, vinyl to wood, glass fiber to metal, paper to metal, and rubber to metal. Tables have column headings covering uses of each type, method of application, color, base, solvent, viscosity, per cent solids by weight, and net weight in lb per gal.

Bul titled "Adhesives, Coatings, and Sealers" is available from The Adhesives and Coatings Div., Minnesota Mining & Mfg. Co., Dept. CP, 423 Piquette Ave., Detroit 2, Mich. When inquiring specify CP 5961 on handy form, pages 2 and 3.

Higher capacity per size claimed for safety relief valve

Announcement has been made by manufacturer of an improved safety relief valve claimed to have a higher capacity for its size than others. Design includes a free-acting, self-aligning disc and a "floating" guide (readily adjustable for control) which assists in opening and closing action, as well as affording an additional self-aligning feature. Disc and disc holder on valve are of forged copper alloy.

Features are said to offer advantages of reduction in size of boiler opening required to mount valve, reduction in boiler head-room, easier and more positive operation, and easy replacement or re-conditioning of working parts. Uni-Line 41-W-200 Series valves are available in sizes from 1½ to 6".



Has self-aligning features

(Safety-relief valves are a product of J. E. Lonergan Co., Dept. CP, 2nd and Race St., Philadelphia 6, Pa. . . or for more information check CP 5962 on handy form, pages 2 and 3.)

**more than 50 years
of experience in
designing and
building dryers
for industry...**

**KNOW THE RESULTS
BEFORE YOU BUY**

Louisville engineers will test your dryer needs in our laboratory. When required, a pilot model will be checked in your plant before full-size dryers are built.

Louisville's creative engineering pre-determines results for you!

Louisville dryers

**used throughout
the world for
great efficiency
with low maintenance**

**LOUISVILLE DRYING
MACHINERY UNIT**

**GENERAL AMERICAN
TRANSPORTATION CORPORATION**

Dryer Sales Office: 139 S. Fourth Street, Louisville 2, Kentucky

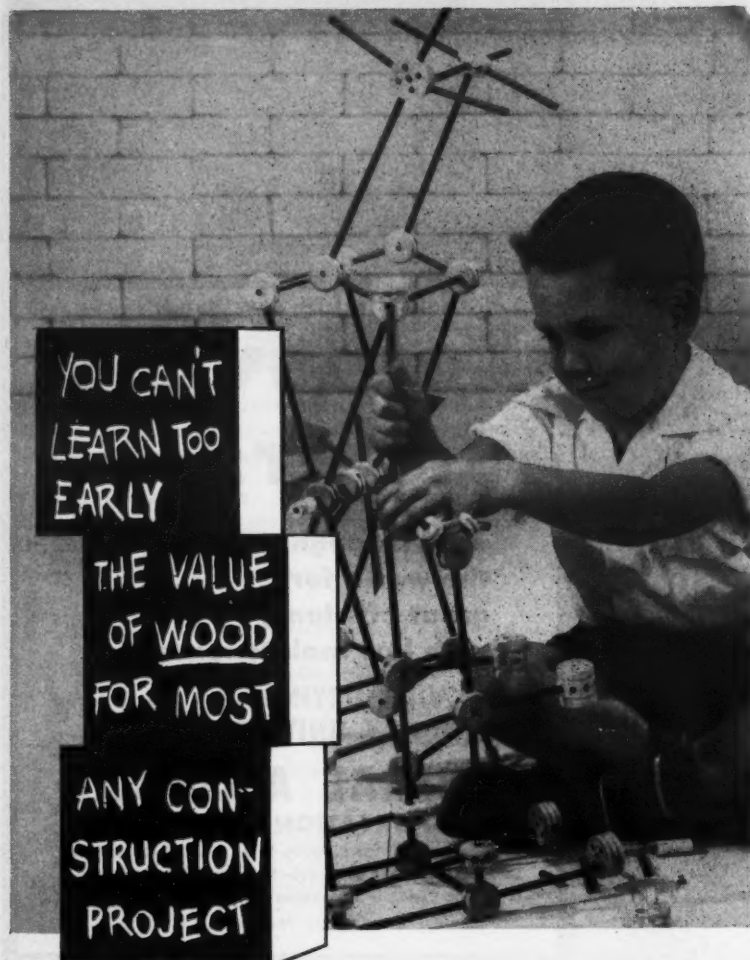
General Offices: 135 South LaSalle Street, Chicago 90, Illinois

In Canada: Canadian Locomotive Co., Ltd., Kingston, Ontario

OFFICES IN ALL PRINCIPAL CITIES

When inquiring check CP 5963 on handy form, pgs. 2-3

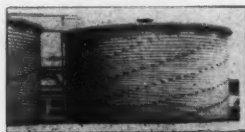
*engineering
and maintenance*



MOST ENGINEERS have long discovered the practicability of wood for many industrial installations. And each day, more engineers come to depend on SANTA FE, one of America's most complete facilities for the design and manufacture of industrial wood products. As specialists in wood engineering, SANTA FE can provide assistance on your most complex problem. Write today!



COOLING TOWERS • WOOD TANKS
WOOD PIPE • CROSS ARMS



AND OTHER ENGINEERED INDUSTRIAL WOOD PRODUCTS

SANTA FE TANK & TOWER CO.

5401 South Boyle Avenue, Los Angeles 58, California

BRANCH OFFICES IN ALL MAJOR CITIES

SINCE 1903



When inquiring check CP 5964 on handy form, pgs. 2-3

Here are two of the Kindex cards that tell up-to-minute accurate story on maintenance, repair, supplies, inventory, and other factors of vital interest to maintenance department heads and management

Answer to Maintenance Control "In the Cards"

Cards for each piece of equipment plus written work orders provide system that can be integrated with production, cost accounting, inventory, and depreciation elements

"LET'S look at the record" is a good watchword for those responsible for maintenance management. Of course, this takes for granted that a system of controlling records has been set up to provide a complete and clear picture of a plant's preventive maintenance operations. Such a system should prompt necessary action at regular intervals and flash a signal that

eliminates unintentional omissions that usually prove costly.

How can such records be kept and what are some of the main factors that must be covered in an effective system? Many plants are keeping close control over preventive maintenance by suitable visible records in the form of Kindex cards. A mechanical inspection card is provided for each piece of

equipment. On this is listed machine's characteristics, specifications, value, as well as installation data. Records of periodic inspection and lubrication are posted on this card. Along the bottom of the card is a "Graph-A-Matic" signal, or colored slide (see illustrations), which is moved forward to point indicating date preventive maintenance was last performed.

Cards are individually housed in vertically arranged, shingled pockets. Glancing down a row of pockets, a supervisor can immediately see by any out-of-line signals whether any equipment has been neglected. Number of each machine, description and location can always be checked in an instant.

However, maintenance management is not restricted to preventive maintenance. There is also repair



Here's the file that keeps vital maintenance records safe and instantly accessible. Cards provide current information on each piece of equipment as well as complete history

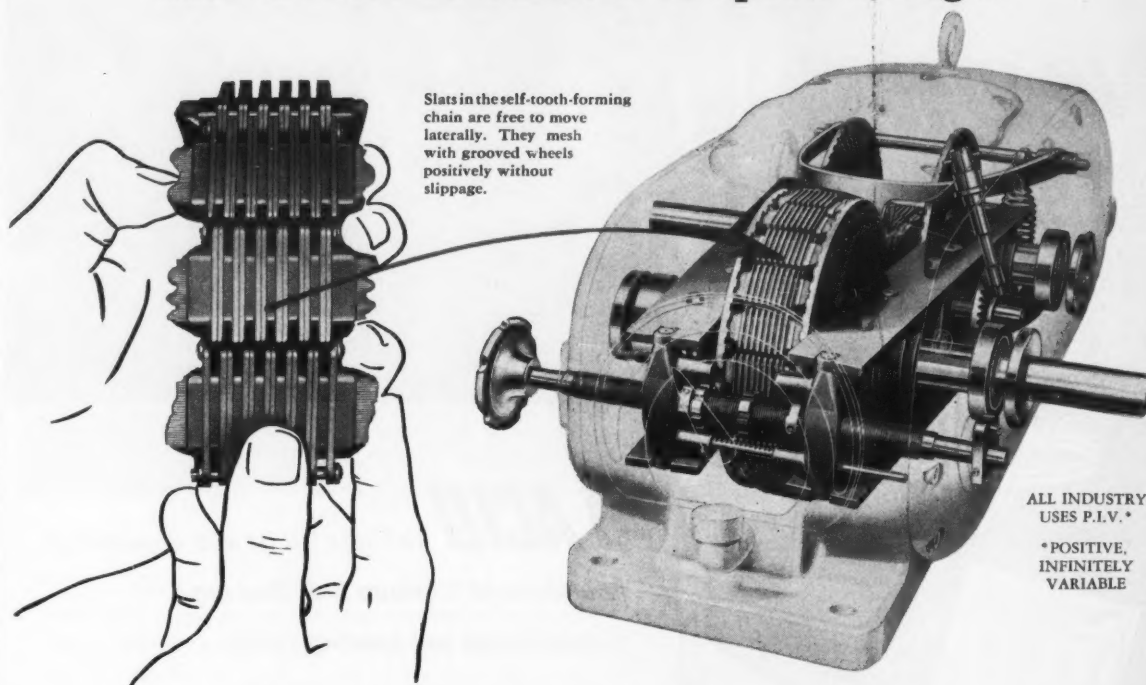
work, frequently complicated, that calls for skilled labor. For this phase of maintenance an all-encompassing system has been devised with controls designed to integrate with elements of production, cost accounting, inventory and depreciation. In extending the basic system used for preventive maintenance, additional cards are included for insertion in the shingled pockets.

To facilitate assembling figures and data to be posted on these cards, written work orders are used. These are 6-part interleaved carbon forms 5" x 8". When filled in by originating source, one copy is retained, two go to maintenance department and one each to cost, production control and accounting departments. All information pertinent to each department is made available with a single writing. One of the maintenance copies serves as a requisition for materials, the other is inserted on a schedule board (Sched-U-Graph) under individual worker's name so he can easily pick up his job assignment. Board also serves as a continuous control record for foreman.

In addition to the mechanical inspection card already described, the upper pocket of the same file has a

(Continued on next page)

Completely **POSITIVE**... Completely **STEPLESS** with an infinite number of speed changes

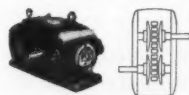


ALL INDUSTRY
USES P.I.V.*

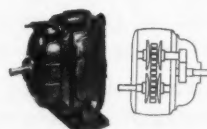
* POSITIVE,
INFINITELY
VARIABLE

P.I.V. Variable Speed Drive gives you exact selection from maximum to minimum speed

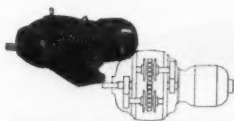
4 of 16 P.I.V. types, 1/2 to 25 hp. — ratios to 6:1
Horizontal or Vertical Mountings



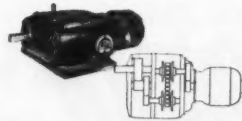
Basic Positive, Infinitely Variable Speed Drive. Compact.



P.I.V. with single reduction input or output helical gears.



Motorized P.I.V. with single reduction input and output helical gears.



Motorized P.I.V. with single reduction input and double reduction output helical gears.

ONLY Link-Belt's P.I.V. Variable Speed Drive uses self-tooth-forming chain to provide positive, stepless speed changing. The chain meshes with grooved wheels, transmits power without wasteful slip.

What's more, Link-Belt's P.I.V. changes speeds accurately under full load, delivers full-rated horsepower to your machines. That's because P.I.V. is not dependent on friction for power transmission. Its all-metal construction is not affected by atmospheric conditions.

Adjustment is easy. You can obtain an infinite number of speeds with manual, electric, pneumatic or hydraulic controls... hold the exact speed you need at any setting.

There may be a process in your plant that requires exact, variable speed transmission. If so, it will pay you to contact your nearest Link-Belt office. They'll show you how P.I.V. can increase the flexibility and efficiency of your machines. Send for Catalog No. 2274.

LINK-BELT
P.I.V. VARIABLE SPEED DRIVE

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities.

13.116

When inquiring check CP 5965 on handy form, pgs. 2-3

(Continued from preceding page)

card for entries to annual depreciation schedule and monthly maintenance cost summary. Postings to monthly cost summary are made from maintenance copy of Multiset Work Order when it comes from cost department.

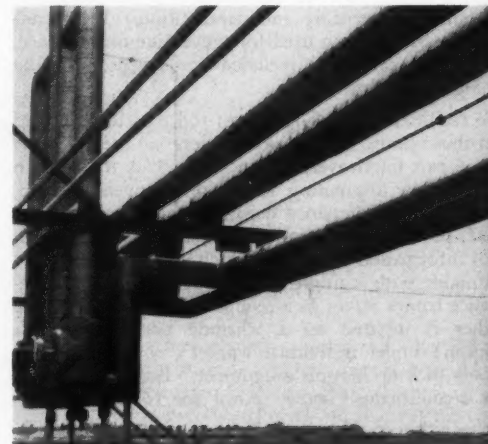
Of related interest to requisitioning supplies is the matter of stores control. In lower pocket of each machine's file section there is an "In and Out Balance" card with quantities received, disbursed, and on-hand date and total month to date. Month of last disbursement is indicated by movable signal which serves as frequency control. Signal on right-hand bottom edge is adjusted to give inventory record. Upper pocket houses record of past orders and monthly usage record.

From all data available, those in charge of maintenance can make highly informative reports to management. These can give a clear picture of ratio of programmed work to emergency work, amount of maintenance by any period or category of equipment. Overtime and inventories of supplies can also be reported. System not only controls maintenance operations but brings factors that are frequently hidden to light.

(Kardex with "Graph-A-Matic" signals, "Multiset" Work Orders and "Sched-U-Graph" are developments of Remington Rand Inc., Dept. CP, 315 Fourth Ave., New York 10, N. Y. . . or for more information check CP 5967 on handy form, pages 2 and 3.)

Easily installed, low-temperature pipe insulation combats rigors of Gulf Coast climate

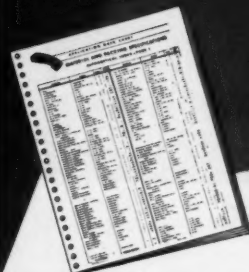
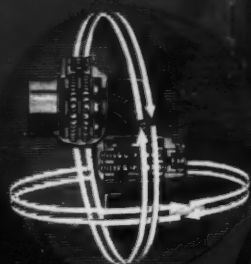
Low-temperature pipe insulation is said to have proved itself remarkably durable and resistant to moisture when exposed to hot and humid climatic conditions of major Gulf Coast ammonia plant. Over four year period of installation, none of the pipe, valve, fitting



Insulation in service at Gulf Coast plant shows remarkable durability in hot, humid climate



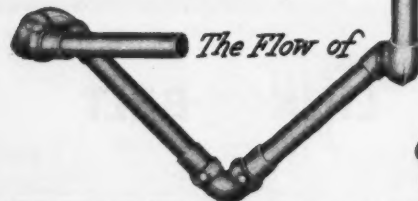
HEALING DRUG



Write for
Application Data
Sheet and
Catalog 53-C
Dept. No. 1-CP

Whether it's propane, butyl alcohol, vegetable oils or sulphuric acid, CHIKSAN loading racks with ball bearing swivel joints can be depended upon to handle these hard to handle chemical products with ease, economy and complete safety.

Chiksan has material and packing specification sheets listing 317 chemical products with recommendations for types of joints, metal and packing material to be used.



The Flow of

Enterprise Relies on

CHIKSAN

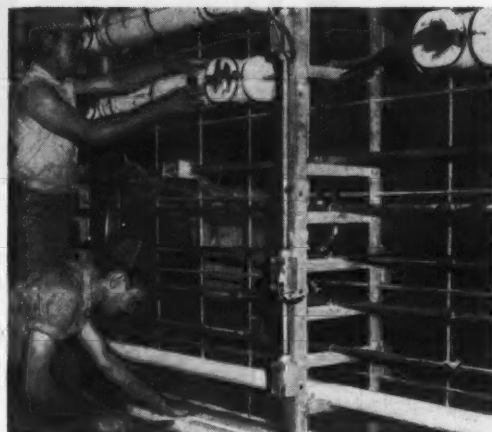
Ball-Bearing Swivel Joints

Representatives in Principal Cities



CHIKSAN COMPANY • BREA, CALIFORNIA • Chicago 28, Illinois • Newark 2, New Jersey
Well Equipment Mfg. Corp. (Division), Houston 1, Texas • Chiksan Export Company (Subsidiary), Brea, California • Newark 2, N. J.

When inquiring check CP 5966 on handy form, pgs. 2-3



Installing insulation on high-pressure lines carrying 25° below zero refrigerant

or vessel covering has rotted or split, become moldy, water-logged, frozen, or soft. Original insulation, covered with 15 lb felt has remained intact in spite of exposure to sun and rain.

Insulation is made of Styrofoam, Dow Chemical Company's expanded polystyrene. It has a permanent "K" factor of .23 to .25. Compression strength is 25 psi and effective insulation is in range from sub-zero to 190°F. Easily cut on the job, insulation can be installed by same simple methods employed with high-temperature insulation.

("Vapo-Wall" insulation is a development of MMM, Inc., Dept. CP, 7120 Avenue C, Houston 11, Texas . . . or for more information check CP 5968 on handy form, pages 2 and 3.)

Pressure sensitive adhesive binds Teflon to materials, forming 15 psi bond

Uses: For binding Teflon to Teflon, or Teflon to metal and a variety of other materials.

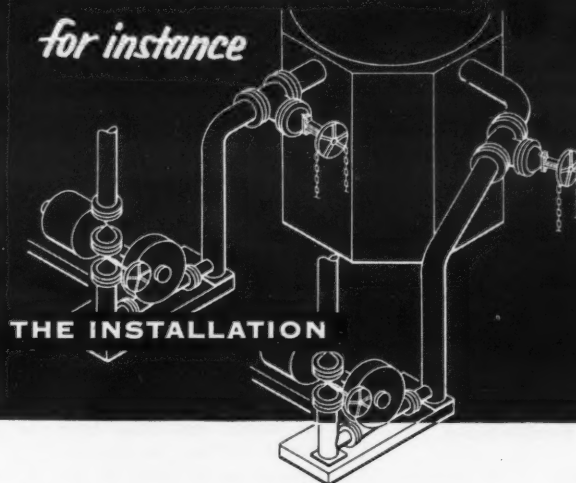
Features: Adhesive is of pressure-sensitive type, and tests are said to indicate a peel strength of over a thousand gm/in or a direct pull of 12 to 15 psi for Teflon to Teflon, and Teflon to stainless steel. Material is also reported to have good acid and alkali resistance, and excellent electrical properties.

Description: Adhesive can be applied by brushing, dipping, or spraying. For small applications, brushing is said to be quite adequate. Air drying is satisfactory, but takes several hours which can be reduced by heating from 15 to 30 min @ 210°F. Heating for five min at 300°F will result in greater adhesive strength.

(Adhesive, Flexrock #80, is a product of Packing Div., Flexrock Co., Dept. CP, 3611 Filbert St., Philadelphia 1, Pa. . . . or for more information on manufacturer's product reader may simply check CP 5969 on the convenient Reader Service slip located between pages 2 and 3.)

You're Sure of Tighter Seating with Crane Steel Gates

...in a Butadiene Plant,
for instance



At a Southwestern butadiene plant, using Crane 18-inch steel gate valves on suction lines from extractive distillation towers to pumps. Working pressure, 90 psi, 250 to 300 deg. F.

THE CASE HISTORY

Original valves in this service were lubricated plug valves, but they couldn't be made to seat tightly on the light hydro-carbons and furfural mixture. Their continual leakage burdened the plant with excessive maintenance, and a constant threat to process control. All these lubricated plug valves were replaced with Crane 33X steel wedge gate valves.

Installed more than 2 years ago, the Crane valves completely remedied the leakage trouble, and to date, none have required any maintenance whatsoever. They keep working perfectly with but prescribed routine care.

THE BETTER QUALITY...BIGGER VALUE LINE...IN BRASS, STEEL, IRON

CRANE VALVES

CRANE CO., General Offices: 836 S. Michigan Ave., Chicago 5, Illinois
Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

When inquiring check CP 5970 on handy form, pgs. 2-3

VALVE SERVICE RATINGS

SUITABILITY:

Have what the job takes

FEATURES:

Exelloy seating

MAINTENANCE COST:

Zero

SERVICE LIFE:

Installed 1951—long life ahead

OPERATING RESULT:

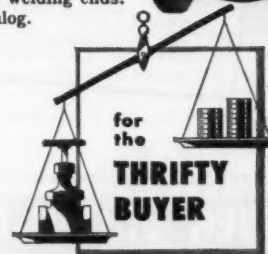
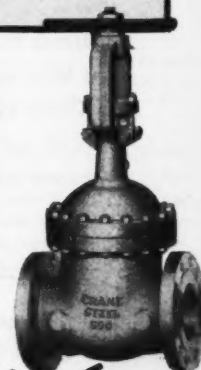
Valve efficiency restored

AVAILABILITY:

Catalog item—No. 33X

THE VALVE

Product of pioneer skill in steel casting, and with a long record of service to petroleum and petrochemical industries, Crane steel valves stand apart from the ordinary. Yet they actually cost less for service delivered. Choose from the widest range of body and trim materials; in all pressure classes, sizes; flanged, screwed, or welding ends. See your Crane Catalog.



The OLIVITE Acid-Handling Pump is really 2 pumps in one!



Yes, many chemical plant operators have come to regard the Olivite Pump as two pumps in one... one, an efficient centrifugal pump for handling liquids; the other, a durable pump with high resistance to corroding solutions.

In one large chemical plant with extensive acid-pumping operations, more than 100 Olivite Acid-Handling Pumps are now in service. They are handling several different solutions, both hot and cold, with widely varying pH values.

Thousands of these corrosion resistant and leak-resistant pumps have been supplied to industry through the years. Chances are the Olivite could fit very nicely into your pumping operations. Write for our Bulletin 308-R, which gives complete information. When you do, please give full details of your pumping problems.

It is possible you may also be interested in the ODS Diaphragm Type Pump which gives excellent results in pumping solutions as well as slurries. Bulletin 309-R gives full details.

WORLD WIDE SALES, SERVICE AND MANUFACTURING FACILITIES

OLIVER UNITED FILTERS

NEW YORK 36 - 33 West 42nd Street • CHICAGO 1 - 221 North LaSalle Street
OAKLAND 1 - 2900 Glascock Street • SAN FRANCISCO 11 - 260 California Street
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FACTORIES:
Hartleton, Pa.
Oakland, Calif.

When inquiring check CP 5971 on handy form, pgs. 2-3

ENGINEERING & MAINTENANCE

Types of compounds used for barrel finishing

Illustrated 32-page catalog lists compounds for descaling, deburring, abrasive cut-down, non-abrasive cut-down, finishing, coloring, burnishing, metal cleaning, and rust inhibiting. Application index gives particular standard and special purpose compounds recommended for various applications.

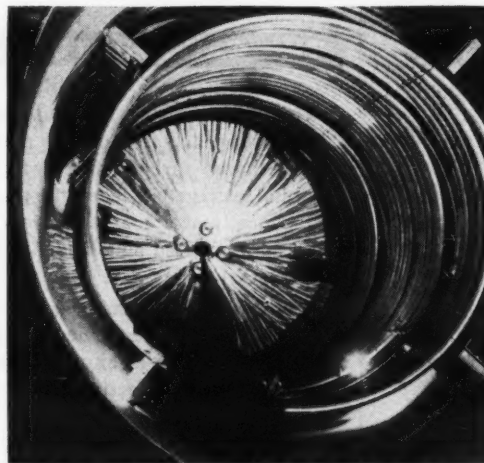
Bul LCC-53-1 is available from Lord Chemical Corp., Dept. CP, 2068 South Queen St., York 9, Pa. Specify CP 5972, pages 2 and 3.

No unusual maintenance problems with outside installation of antibiotics fermentors...

battery of units at Upjohn, in operation for 10 months, saved time and initial investment

This past January a battery of eight fermentors for antibiotic production was placed in operation at The Upjohn Co. in Kalamazoo, Mich. During this time of service no unusual maintenance problems have been presented by the tanks. Maintenance costs for the outside installation have run about the same as they would for a comparable set-up inside a building. Upjohn saved, however, on capital investment and building time using outdoor installation.

Tanks themselves measure 132" OD by 282" high. They are closed, all-welded vats without jackets, but include 3" OD stainless steel coils. Tanks were



Welding coils to inside of tank during fabrication of 10% clad fermentors

fabricated of 1/2" thick steel, 10% clad with stainless steel. Stainless used was type 304. Internal working pressure is 50 psi.

This equipment is not subjected to any particularly corrosive chemical. Materials that go into a fermentor are the food stuffs on which the micro-organism grows, and consist of carbohydrates, pro-

BIN STUCK LATELY?



"There is. Just use a CLEVELAND Vibrator for quick, efficient easy handling of your dry chemicals."



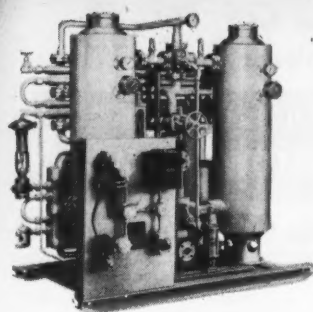
Catalog No. 109 on request



2706 Clinton Ave. • Cleveland 13, Ohio

When inquiring check CP 5973 on handy form, pgs. 2-3

CHEMICAL PROCESSING



This is a Pritchard HYDRYER*—the choice of critical buyers in the petrochemical industry for efficient, dependable dehydration!

This quality packaged unit promises long, trouble-free operation in drying compressed air and other gases for instrument and process controls.

Absorbents are carefully selected for your drying requirements. Completely factory assembled.

Custom units designed for any special need. To cut dehydration costs, contact Pritchard today.

*Registered Trade Name

Industry's Partner for Progress

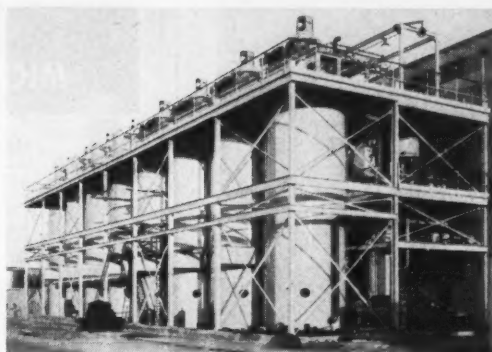
J.F. Pritchard & Co.
ENGINEERS • CONSTRUCTORS
MANUFACTURERS

Dept. 308, 210 West 10th St.,
Kansas City 5, Mo.

COOLING TOWERS • SPECIALIZED HEAT EXCHANGERS
GAS AND AIR TREATING EQUIPMENT • CONSTRUCTION
AND PROCESSING FACILITIES

When inquiring check CP 5974
on handy form, pgs. 2-3

ENGINEERING & MAINTENANCE



Outside installation of fermentors at Upjohn used in processing of penicillin, neomycin, erythromycin, cortisone, and hydrocortisone

teins, fats, water, and air. Need for stainless steel equipment in antibiotic production is tied in with the need for sanitary growing conditions.

Savings accruing from this installation, according to Upjohn, include: easier cleaning, more efficient heating and cooling.

(One of the fabricators of the fermentation tanks installed at Upjohn was the Pfaudler Co., Dept. CP, 1000 West Ave., Rochester 3, N. Y. . . or check CP 5975 on handy form, pages 2 and 3.)

General wiping needs of industry met by strong, clean, safe, disposable paper product

Uses: For complete range of industrial wiping from heavy machines to precision work.

Features: Paper product is said to be clean, strong, safe, and uniform; highly absorbent, versatile, handy, and easily disposable.

Description: Each wiper consists of two "Perf-Embossed" sheets which are welded together for durability, giving thorough cleaning action and maximum dirt retention. Chemical treatment of paper creates wet strength.

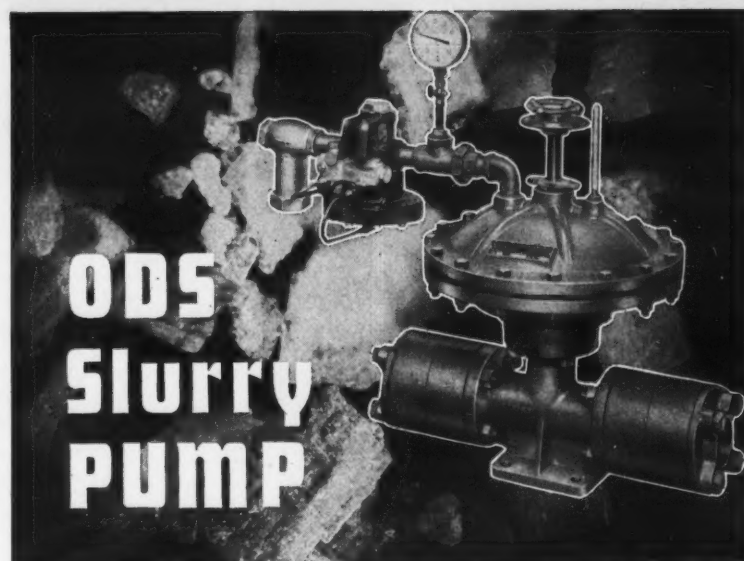


Usable on heavy machines or precision work

Product is packaged in a compact size box containing 125 wipers. Each box has "pop-up" feature that makes another wiper automatically available as soon as one has been removed from container.

Advantages claimed for the product are better health protection, reduction of employee accident rate, protection of delicate surfaces to be cleaned, and reduction of the spread of dermatitis.

(Industrial wipers are a product of Scott Paper Co., Dept. CP, Chester, Pa. . . or for more information check CP 5976 on handy form, pages 2 and 3.)



... protects friable crystals against degradation

AND here's some proof that the ODS does protect against crystal spoilage . . . proof of the relatively gentle handling of crystalline products by the ODS Diaphragm Slurry Pump which in this case is grainer salt.

Screen Mesh	Salt at Grainer Discharge	Salt After ODS Pump*	Salt After Centrifugal Pump*
10	10.2%	11.4%	1.6%
14	17.8%	18.3%	7.3%
20	15.6%	17.7%	9.8%
28	22.0%	24.6%	11.5%
35	14.9%	14.6%	20.6%
48	10.0%	7.6%	18.6%
65	5.4%	3.1%	11.2%
100	2.2%	1.0%	6.0%
-100	1.9%	1.7%	3.4%

*Note that both pumps had a 160 foot carry and a 45 foot lift. Note also, that in certain sizes, there was actually a measurable increase in crystal size resulting from the ODS brine cooling effect.

If degradation of crystalline size and structure is important when the slurry in your process is handled, you certainly should check on the merits of the ODS Pump. Even if crystal degradation is not an important factor, other advantages will appeal to you . . . advantages such as low maintenance, no mechanical linkage to the diaphragm, no weakening holes in the diaphragm, no clogging of the valves. Write or call our nearest sales office.



308-R & 309-R

Bulletin 309-R gives full details of the ODS Pump. Shall we send you a copy?

If you are handling clear chemical solutions of any type, hot or cold, our Olivite Acid Handling Pump will probably serve you best. Shall we send you a copy of Bulletin 308-R?

WORLD WIDE SALES, SERVICE AND MANUFACTURING FACILITIES

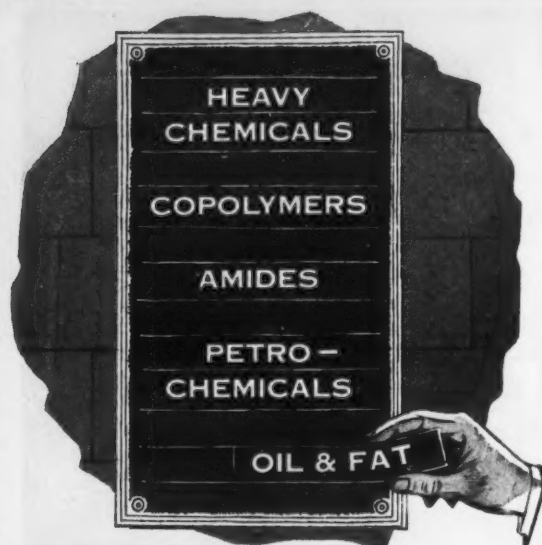
OLIVER UNITED FILTERS

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FACTORIES:
Hazleton, Pa.
Oakland, Calif.

When inquiring check CP 5977 on handy form, pgs. 2-3



Oil and Fat Industry uses **ELECTRUNITE** Heat Exchanger Tubes

● Add to the growing list another industry that depends on Republic **ELECTRUNITE** Heat Exchanger Tubes. And for good reasons.

The oil and fat industry has a continuous process. When they shut down it means time. And money. And higher production costs.

Tubing that rolls in easily can cut costs. **ELECTRUNITE** tubing does because it's uniformly ductile, easily workable. Uniform wall thickness is important, too. And so are uniform diameter, uniform concentricity and uniform strength. It meets ASTM Specification A-214 for carbon and A-269 in stainless analyses. It's also made to meet many customer specifications.

You'll find all these advantages, and many others, only in Republic **ELECTRUNITE** Heat Exchanger Tubes. There are no hidden defects. **ELECTRUNITE** Tubes are made from flat-rolled steel that's inspected on both sides before the tubing is formed. It's free from scale, scabs and slivers, has a fine surface that resists corrosion. No longitudinal thin spots, either.

For new equipment . . . or re-tubing . . . it will pay you to specify **ELECTRUNITE** Pressure Tubes. Available in both carbon and stainless steel analyses. Write for Booklet CEC-53 for all the facts.

STEEL AND TUBES DIVISION
REPUBLIC STEEL CORPORATION
206 EAST 131st STREET • CLEVELAND 8, OHIO
Export Department: Chrysler Building, N. Y. 17, N. Y.



ELECTRUNITE — The Original Electric Welded Boiler Tube

When inquiring check CP 5978 on handy form, pgs. 2-3

ENGINEERING & MAINTENANCE

Photo portfolio of heat-treating furnace installations

Installations of gas, oil, and electric heat-treating furnaces are pictured and described in eight-page two-color brochure. More than 14 types of furnaces are illustrated including roller hearth, chain conveyor, belt conveyor, overhead slot-in-roof, car bottom, pit, strand heating, and aluminum soaking pit. Furnaces are for use in processes with and without protective atmospheres including annealing, austempering, brazing, carburizing, forging, galvanizing, hardening, homogenizing, malleablizing, martempering, nitriding, normalizing, pearlitizing, vitreous enameling, and others.

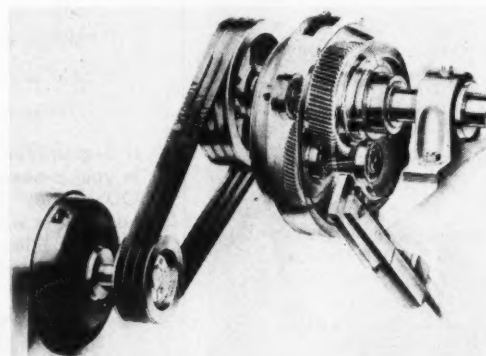
Brochure on modern industrial furnaces is issued by Lee Wilson Contracting Co., Dept. CP, 20005 West Lake Rd., Cleveland 16, Ohio. When inquiring specify CP 5979 on handy form, pages 2 and 3.

Design of shaft mounted reducer places input and output shafts above oil level . . .

eliminates need for bearing seals to operate against a head of oil

Uses: As a shaft-mounted speed reduction unit of the 13-to-1 ratio class.

Features: Concentric shaft design of unit places both input and output shafts above oil level. This eliminates necessity for bearing seals to operate



Housing provides permanent gear and bearing alignment

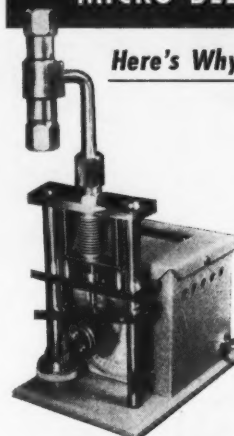
against a head of oil. Additional features include a leak-proof, anti-friction oil sealing system, interchangeable split tapered bushings, and use of both ball bearings and tapered roller bearings.

Description: Adaptable to any shaft-size up to 3-15/16", Shaft King speed reducers are compact, requiring only standard shaft lengths (twice shaft diameter plus clearance) to be mounted directly on shaft of driven machine.

Two trains of flame hardened helical gears reduce driven shaft speed to obtain 13-to-1 ratio. Gearing and bearings are continuously splash lubricated by

The Perfect Pump for Chemical Laboratories . . .

CORSON-CERVENY MICRO-BELLOWS PUMP



Here's Why!

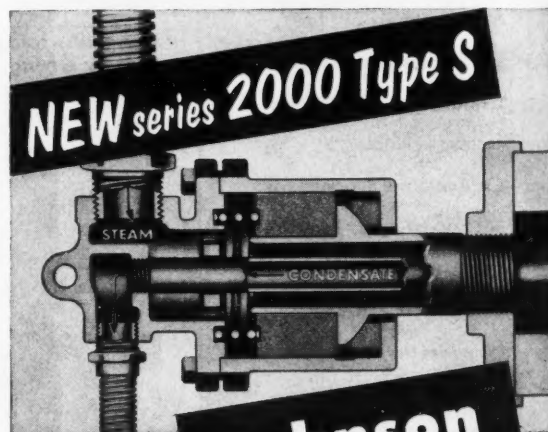
- All parts in contact with pumped liquid are stainless steel.
- Cone-to-taper fittings prevent materials handled from contamination by the pump.
- Adaptable to many highly specialized uses. It can be equipped to facilitate handling of high melting materials, to pump low boiling materials, to handle gaseous materials.
- It's compact—6" x 3 1/2" x 10 3/4"; weighs 5.6 lbs. Made in three sizes for pump rates of 15 to 1000 ml. per hour; 30 to 2000 ml. per hour; and 30 to 7000 ml. per hour. Also available in "Teflon."

We have a booklet that gives all construction, operation and application details of the Corson-Cerveny Micro-Bellows Pump. Write for your copy.

RESEARCH APPLIANCE COMPANY

Box 463, West View Road, Pittsburgh 9, Pa.

When inquiring check CP 5980 on handy form, pgs. 2-3



NEW series 2000 Type S

Johnson Self Supporting Joints

- Now Smaller Size
- Lighter Weight
 - Lower Cost
 - Longer Life

WRITE FOR NEW CATALOG



THE JOHNSON CORP., 826 WOOD ST., THREE RIVERS, MICH.

When inquiring check CP 5981 on handy form, pgs. 2-3

CHEMICAL PROCESSING

high speed gear and counter-shaft pinion which operate in an oil reservoir in the lower third of the three-wall housing.

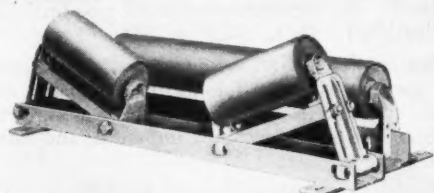
For protection against sudden overload or jamming conditions, speed reducers can be equipped with torque-arm overload release. As a safety precaution on applications where reversing must be prevented, unit may also be equipped with an internal backstop.

(Product of American Pulley Co., Dept. CP, 4200 Wissahickon Ave., Philadelphia 29, Pa. . . or for more information check CP 5982 on handy form, pages 2 and 3.)

Longer belt life is possible with variable troughing belt conveyor idler

Uses: To provide smooth belt transition between troughing idlers and flat pulley.

Features: Angle of inclination of concentrator rolls is adjustable from 20° to fully horizontal. This permits gradual flattening of belt as it approaches



Helpful in many types of belt conveyor installations

head pulley, thus minimizing stresses and resulting in longer belt life, according to manufacturer.

Description: Idler is available in two types: Series 100, designed for belts carrying all but the heaviest and coarsest materials, in seven belt widths from 24 to 60"; and Series 200, for belts carrying the heaviest and coarsest materials, in six belt widths from 36 to 72".

(Belt idler is a product of Link-Belt Company, Dept. CP, 307 N. Michigan Ave., Chicago 1, Ill. . . or for more information check CP 5983 on handy form, pages 2 and 3.)

Steam trap service guide issued

Manual intended to take guess-work out of trapping discusses installation, testing and preventive maintenance, inspection and repair, and trouble shooting. Included in 8-page guide are 10 diagrams showing recommended trap hook-ups.

Bul 239 is issued by Armstrong Machine Works, Dept. CP, Three Rivers, Mich. When inquiring specify CP 5984 on handy form, pages 2 and 3.



JUST A TWIST OF THE WRIST

That's all it takes to clean the Cuno AUTO-KLEAN—the strainer that can be continuously cleaned while it's working.

Turning the handle one revolution moves the strainer element through comb blades, removing all dirt from strainer surfaces. Dirt particles fall to bottom of housing, where they can be drained off periodically. Cuno's exclusive combing operation cleans thoroughly—without costly interruption of fluid flow.

- AUTO-KLEAN's permanent metal filter element is available in steel, brass or stainless steel for long trouble-free service under any conditions.
- AUTO-KLEAN is adaptable to any fluid-flow system.
- From acids to tar . . . if you can pump it, Cuno can filter it. Capacities range from one gallon per hour to 3,800 gallons per minute.

A 3.8

ENGINEERED FILTRATION

Removes More Sizes of Solids
From More Kinds of Fluids

AUTO-KLEAN (disc-type) • MICRO-KLEAN (fibre cartridge) • FLO-KLEAN (wire-wound)

When inquiring check CP 5985 on handy form, pgs. 2-3

CONTINUOUSLY CLEANABLE STRAINER UPS PRODUCTION IN CHEMICAL PLANTS

All-metal AUTO-KLEAN assures
non-stop fluid filtration

You never need to stop a run to clean the filter when you use a Cuno AUTO-KLEAN. Just an occasional rotation of the handle does the cleaning job—while fluid is flowing through the strainer.

Thus, no loss of production, no chance of contaminating your product by exposure while cleaning or replacing an element.

AUTO-KLEAN's all-metal construction makes it ideal for the chemical industry. Resistant to high temperatures, AUTO-KLEAN's can also be supplied in metals that resist the corrosive action of most chemicals and solutions. And it's easy to sterilize AUTO-KLEAN with solvents or steam.

Of course, AUTO-KLEAN makes the recovery of expensive solids a simple operation.

The compact AUTO-KLEAN will give you full-flow filtration in space which would limit ordinary filters to by-pass service. And AUTO-KLEAN's low pressure drop permits this full-flow service on gravity, low pressure, or suction lines—with no loss in operating efficiency.

The fixed-space metal discs in this modern strainer positively remove all solids larger than the specified disc spacing—from .0035" (170 mesh) up to .062" (12 mesh).

Find out today how AUTO-KLEAN can improve your own production program.

A 3.12

Cuno Engineering Corporation
Dept. 1612B, South Vine St., Meriden, Conn.

Please send information on Cuno AUTO-KLEAN

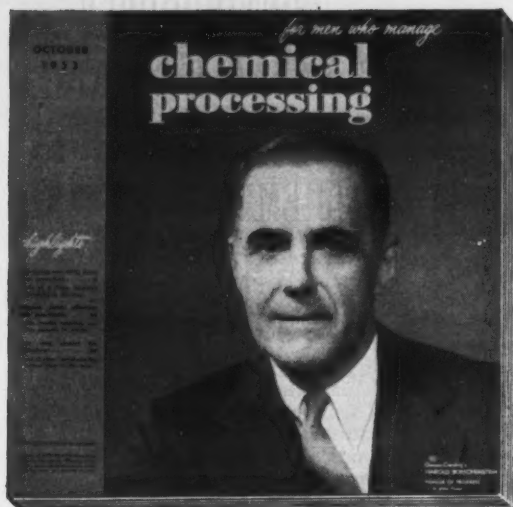
for (fluid)

Name

Company

Address

City Zone State



Have you wondered
why this magazine
comes to you

...without charge?

MAYBE, LIKE MANY others, you've always thought that all publishers make their money, or much of it, from the subscriptions they sell.

'Tisn't so . . .

. . . no, 'tisn't so. With the exception of a few general magazines (e.g. *READER'S DIGEST*) that sell hundreds of thousands — some millions of copies — most industrial publishers with relatively small circulations actually lose money on their subscription sales.

Then how do industrial publishers make money? As you can guess, they make it from the advertising they sell. *Total subscription sales are hardly a "drop in the bucket" compared to advertising revenue.*

Advertisers demand best coverage

Since advertisers pay the bills, they demand best possible coverage of all important men in the field. So it's up to the publisher to publish the most readable magazine possible . . . then to insure coverage of the maximum number of the best readers.

You can't do that by selling subscriptions — sales costs are high — a large share of the subscribers cancel each year — and no matter how much time, money, and pressure is used

there are always some of the important men who will never buy.

As you can see, the most effective method of getting the kind of coverage advertisers want is (a) to hand-pick the most important men; (b) send the magazine to ALL these men; and (c) to make the magazine so interesting, so valuable that they will want to read it.

That's why . . .

. . . *Chemical Processing* is sent only to qualified readers . . . selected management and technical key-men in the chemical industry; that's why you get *Chemical Processing* free — that's why we spend thousands of dollars on each issue to make it worth your time to read it. For you are an important reader in the chemical processing field.

Chemical Processing

Published by Putman Publishing Company

Creators of PUTMAN-STYLE Magazines
... terse, vital editorial; "hand-picked" circulation;
square, high-visibility format; quality readership;
hence more *READER ACTION*



ENGINEERING & MAINTENANCE

Folder on dust and fume eliminators

Two wet type dust and fume eliminators are described in 4-page illustrated bulletin. One is for wet collection and elimination only while other is combination primary dry and secondary wet collection and elimination unit. Latter unit has integral dry type pre-cleaner for dry collection of heavier and most fine particles. This makes it particularly useful where material salvage is an operational requirement.

Both combine the cyclonic principle of dust separation and positive high pressure water action to wash impurities from the air in a rotating torrent of water. Capacities of eliminators range from 500 to 50,000 cfm.

Bul VU 8-53 is issued by Schmieg Industries, Inc., Dept. CP, P. O. Box 4701, Detroit 34, Mich. When inquiring specify CP 5986 on handy form, pages 2 and 3.

Minimum maintenance required for 5-bolt line blind valve for larger pipe lines

Uses: For applications on larger pipe lines where a line blind valve is called for.

Features: This 18" valve features 5-bolt assembly. It provides either a full-diameter, smooth, round opening, or a permanent, leak-proof shut-off. Service life is said to be practically unlimited, and maintenance is negligible.

Description: Valve has an ASA rating of 150 lb for working pressures to 230 lb. Regular construction is carbon steel, with standard packings of Hycar rubber; however, both valve materials and packings can be furnished for special requirements.

Neck of spectacle plate on valve is suspended on top bolt so that it can be revolved in either direction when opening or blinding the line. Two side bolts on valve swing out making it unnecessary to remove any bolts when reversing spectacle plate.



Bar operated bolts eliminate need for wedges, hammers, and wrenches

VANTON PUMP TAMES CORROSIVE CHEMICALS



POLYETHYLENE flex-i-liner PUMPS

are designed to handle the toughest corrosive chemicals and abrasive slurries.

The durable precision molded flexible liner and the pump body block are the only parts contacting the fluid.

No stuffing boxes, shaft seals, check valves, glands or gaskets to worry about.

Body blocks in: Polyethylene, Bakelite, Buna N Hard Rubber, unplasticized PVC, Stainless Steel. Flexible liners in: Natural and pure gum rubber, Neoprene, Hycar, Buna N, Vinyl, Compag and Silicone. The wide choice of materials means trouble free, corrosion free service.

Pump capacities from fractional to 20 gpm. Illustrated booklet on request, as well as descriptive literature on complete line of corrosion resistant centrifugal pumps, valves, pipe and fittings.



VANTON
PUMP & EQUIPMENT CORP.
EMPIRE STATE BLDG. NEW YORK 1, N. Y.

When inquiring check CP 5987 on handy form, pgs. 2-3

SELLERS

HYDRAULIC JET CLEANER

LEAST EXPENSIVE
TO BUY & OPERATE

MOST EFFECTIVE FOR
HEAVY DUTY CLEAN-UP

Operated by ordinary plant steam and cold water lines, this unit propels a solid jet of extremely high pressured hot water and detergent. The discharge force completely cleans areas up to 30 ft. from operation point, reaching inaccessible machinery parts. Eliminates down time and scaffolding. Removes all soil, sludge, and encrusted deposits.

**CUTS
CLEANING
COSTS
UP TO 94%**

FOR ANY PLANT WITH
5 PSI STEAM & UPWARD

Write for literature and the name
of our local distributor

SINCE 1848

SELLERS

Injector

CORPORATION

1400 Hamilton Street Philadelphia 30, Pa.

When inquiring check CP 5988 on handy form, pgs. 2-3

ENGINEERING & MAINTENANCE

Easily operated by one man, the five bolts on the 18" model are quickly spread and tightened, even in close-coupled, compact manifolds. Bar operated bolts not only eliminate wedges, hammers, and wrenches needed for spreading conventional flanges, but also remove fire hazard of sparking. Bolts are large enough in diameter to meet pressure requirements for corresponding flanges having many more bolts, according to manufacturer.

(Line blind valves are a product of Hamer Oil Tool Co., Dept. CP, 29th & Gardenia, Long Beach 6, Calif. . . or for more information check CP 5989 on handy form, pages 2 and 3.)

Trigger switch actuates bending on portable machine

Uses: For bending pipe.

Features: Portable unit is powered by a $\frac{3}{4}$ hp drill press motor. Trigger switch actuates bending. Toggle switch above trigger switch controls forward or reverse rotation of bend.

Unit will bend $\frac{1}{2}$ to $1\frac{1}{4}$ " IPS pipe to 180°, and is said to average 60 bends per hour with one man.

Description: Bending machine, designated No. 60, operates on 115 v, single phase, 60 c AC or DC. Main driving gear is case hardened and ground for maximum resistance to wear.

Limit switches are preset at factory for 0 and 180° rotation of bending form to prevent possibility of overtravel in either forward or reverse direction. Die forms can be easily changed for pipe sizes.

Unit is designed so it can be placed anywhere along a length of pipe and operated at that location. When not used as a portable bender, it can be mounted on a bench or clamped in a vise.

(Pipe bending machine is a product of Wallace Supplies Mfg. Co., Dept. CP, 1300 Diversey Parkway, Chicago 14, Ill. . . or for more information check CP 5990 on handy form, pages 2 and 3.)

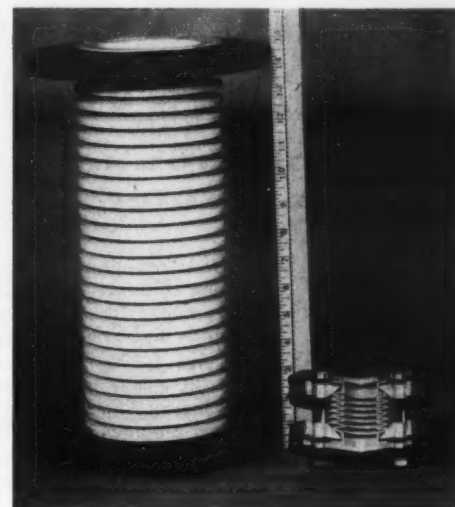
Bulletin features high capacity of control valve

Diaphragm operated control valve is examined in 1-sheet bulletin. Intended for uses wherever it is desirable to control line flow by application of an independent pressure, valve is made in two basic types — normally open and normally closed. For maximum hookup flexibility, diaphragm pressure connection may be indexed to any of four positions: over inlet, over outlet, or either side. Maximum body pressure is 250 psig, diaphragm pressure 300 psig. Valves may be used to handle oil, water, air, or any non-corrosive fluids, and are available in either $\frac{1}{2}$ or $\frac{3}{4}$ " pipe size.

Bul D-53-1 is issued by A. W. Cash Valve Mfg. Corp., Dept. CP, 666 E. Wabash Ave., Decatur, Ill. When inquiring specify CP 5991 on handy form, pages 2 and 3.

"TEFLON" BELLOWS molded by Dore'

are the answer to such piping problems as Misalignment
— Expansion — Contraction — Vibration.

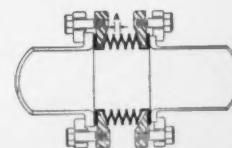


We are successfully molding "Teflon" Bellows in lengths and diameters to meet an ever-increasing range of applications. Shown above is a special long bellows — $14\frac{1}{2}$ " x 3" diameter — molded to meet special requirements.

"Quality Control" assures uniform density, close wall tolerances . . . rigid testing and inspection of every finished bellows guarantees adherence to these controls.

Dore' molded "Teflon" Bellows are inert to a wide range of commodities. Built for 25 lb. W.P., they are available in standard sizes of 1" through 12" diameter — 2" to 5" in length. You get immediate delivery of both standard and special sizes. Specify pipe size and flange-to-flange dimension when ordering.

• For "Teflon" sheets — rods — tubes — packing sets — gaskets — tapes and special molded shapes, you'll find it pays to "DO BUSINESS WITH DORE'."



John L. Dore', Co.

SALES AGENTS IN U.S.A. FOR JOHN L. DORE', INC.
MOLDERS OF "TEFLON" AND "KEL-F" SHAPES
P. O. BOX 7772 • HOUSTON 7, TEXAS

When inquiring check CP 5992 on handy form, pgs. 2-3

MERCO
announces

WORLD'S LARGEST CLARIFIER

of continuous discharge
nozzle design

To provide retention time for greatly increased clarifying efficiency, Merco's new C-3000 clarifier has extra large bowl volume, high centrifugal effects and tremendous disc area.

The Merco C-3000 fills needs not heretofore served. Its unique performance justified flying one of these 6½ ton centrifuges across the continent for an urgent application.

Successful new applications include separations in atomic energy industries, bentonite, alum, and chlorophyllin.

The Merco C-3000 centrifuge can solve a wide range of clarification problems in your industry. Write today for bulletin C-41.



Note the tremendous size of the C-3000 separating bowl to the left. The bowl shown to the right would ordinarily be considered large.

MERCO CENTRIFUGAL CO.

150 GREEN STREET • SAN FRANCISCO 11, CALIFORNIA

When inquiring check CP 5993 on handy form, pgs. 2-3

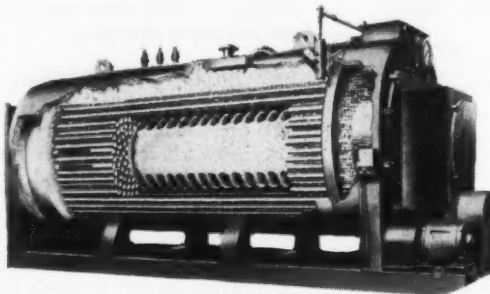
ENGINEERING & MAINTENANCE

Simplified, improved boiler design eliminates need for partition or refractory baffles

Uses: As an automatic steam generator, 20 to 500 hp.

Features: Unit has two-pass design which eliminates need for refractory baffles or partitions in front or at rear, according to manufacturer. Design is reported to make possible easy and full access to all fire surfaces.

Description: In boiler, air for combustion enters furnace through tangential vanes around furnace register. Register is located in furnace throat which is surrounded by heated chamber for returning gas.



Cutaway shows design features

This arrangement makes it possible to produce a controlled mixture of fuel and heated air which in combustion creates a highly radiant flame with a high rate of heat transfer.

After travel through furnace tube, hot gases are forced through 3" return tubes with a spiraling motion — imparted by a heat-resistant alloy steel impeller or vane in each tube — to provide maximum heat transfer and low gas temperature at stack. Under normal operating conditions, stack temperature is said not to exceed 125°F above saturated steam temperature at operating pressure.

(Boiler is a product of Continental Boiler Div., Boiler Engineering & Supply Co., Inc., Dept. CP, Phoenixville, Pa. . . or for more information check CP 5994 on handy form, pages 2 and 3.)

Saves production marking time with self-sticking labels

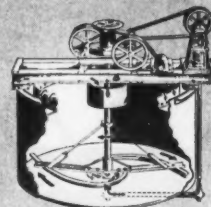
Illustrated 4-page folder shows many ways self-sticking labels can be used. Inert release coating is adhesive when applied to dispenser cards and has no effect on adhesive qualities of the marker. Easy removal of markers results in reduced production marking time and decreases loss of markers due to twisting and tugging distortions.

Bul 122 is issued by W. H. Brady Co., Dept. CP, 727 W. Glendale Ave., Milwaukee, Wis. When inquiring specify CP 5995 on handy form, pages 2 and 3.

DENVER EQUIPMENT



... NOTE THESE FEATURES ...

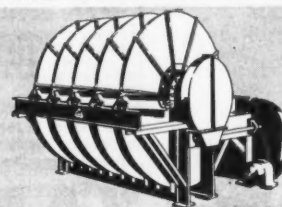


DENVER THICKENER

Size: 6' diameter to 60' diameter.

Features: Beam superstructure, spiral rakes, cut gears in integral lift reducer.

Price examples, 8' dia. x 6' \$1427.00
with steel tank 20' dia. x 10' 3476.00
less drive. 30' dia. x 10' 6959.00
FOB Denver.

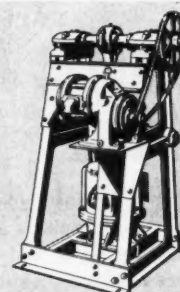


DENVER DISC FILTER

Size: 2', 4' and 6' dia. 2 to 8 disc.

Features: Oversize center shaft, simple renewable automatic valve.

Price examples, 2' dia. x 2 disc. \$1573.00
less drive and 4' dia. x 3 disc 2272.00
vacuum equipment. 6' dia. x 4 disc. 4202.00
FOB Denver.



DENVER DIAPHRAM PUMP

Size: 1" Simplex to 6" Quadruplex.

Features: Adjustable stroke, molded rubber valve seats, positive action.

Price examples, 2" Simplex \$ 406.00
less motor, 4" Duplex 824.00
FOB Denver. 6" Duplex 1914.00



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COMPANY**

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Phone Empire 3-8836

OFFICES IN EL PASO, MEXICO, D.F., VANCOUVER,
LONDON, JOHANNESBURG.

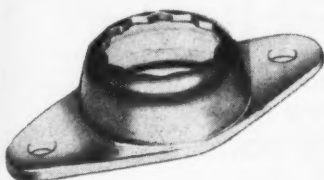
When inquiring check CP 5996
on handy form, pgs. 2-3

CHEMICAL PROCESSING

MAINTENANCE

Light weight strength provided by two fasteners

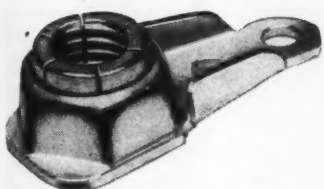
Manufacturer has announced two additions to fastener line. First is a retainer for external wrenching nuts. This retainer is said to make a high strength anchor nut out of the standard external wrenching nut. Standard anchor nut rivet



Retainer for external wrenching nuts

hole spacing has been adopted to provide interchangeability. It is available for external wrenching nuts with thread sizes from 1/4-28 through 1-14. Retainer is made of cadmium plated steel and reportedly provides a fastener combination capable of resisting 160,000 psi minimum tensile stress.

Increased strength and narrow envelope dimensions on width are reported improvements on second addition, a self-locking, lightweight, one lug anchor nut. It is made in both 1/4-28 and 5/16-24 thread sizes and is reportedly designed to



Self-locking, one lug anchor nut

be the lightest as well as strongest self-locking, one lug nut available. Retainer is made of cadmium plated SAE 1050 heat treated steel.

(Products of Nutt-Shel Co., Inc., Dept. CP, 811 Airway, Glendale 1, Calif. . . . or for more information check CP 5997, pages 2 and 3.)

For more information on product at right, specify CP 5998 . . . see information request blank between pages 2 - 3.

CA=Q

The formula for quality **STAINLESS STEEL** valves & fittings



Quikupl



TEE



ADAPTER



COUPLING



90° ELBOW

Fittings



FLANGED FITTING



LAP JOINT WELDING FITTING



SCREWED FITTING



90° ELBOW WELDING FITTING

Accessories



GAGE GLASS FITTING



STRAINER

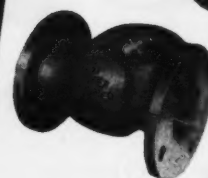
Valves



GATE VALVE



GLOBE VALVE



SWING CHECK VALVE



ANGLE VALVE

"Y" VALVE

As the world's largest producers of cast stainless steel valves, fittings and castings, Cooper Alloy offers unparalleled facilities for mass production and controlled quality. From the drafting board to the foundry, from the machine shop to the inspection floor products from Cooper Alloy are under the supervision of craftsmen with years of training and experience especially geared to the handling of stainless alloys.



THE **COOPER ALLOY** FOUNDRY CO., HILLSIDE, N. J.

LEADING PRODUCERS OF **STAINLESS STEEL** VALVES, FITTINGS AND CASTINGS

Where corrosion...temperature...pressure
cause other valves to fail . . .



THEY'RE "STICK-PROOF"

Operate Instantly...Everytime...Anytime

For more than 20 years, in practically every type of industry, HOMESTEAD LEVER-SEALDS have been giving trouble-free performance in services where extremes of temperature or pressure or corrosive line fluids cause ordinary valves to "stick" or "seize."

HOMESTEAD Lever-Seal PLUG VALVES are "Stick-Proof" because they're "Lever-Seal," which means that a powerful lever-and-screw device, built into every valve, assures positive action at all times under all conditions.

They operate fast, too—full open or closed by a quarter-turn; and because all operating parts are protected from line fluids, service conditions and weather, they last longer and cost less to maintain.

We make them in metals and alloys to suit your requirements in sizes 1½" to 12", for pressures from vacuum to 1500 lbs. and for temperatures ranging from 40° below zero to 1100° F.

**note these exclusive
HOMESTEAD
features**

- Instant Stick-Proof operation.
- Quarter-turn fully opens or closes.
- Positive seal without lubrication.
- Seating surfaces always protected in both open and closed positions. Corrosion practically eliminated.
- Unobstructed straight-line fluid flow.
- All operating parts protected from damaging effects of service conditions and weather.

For Complete details and prices, write today for your copy of VALVE REFERENCE BOOK No. 38-3. No obligation.



HOMESTEAD VALVE MANUFACTURING COMPANY

"Serving Since 1892"

P. O. Box 140

Cornopolis, Pa.

When inquiring check CP 5999 on handy form, pgs. 2-3

MAINTENANCE

**Performance data
on filters**

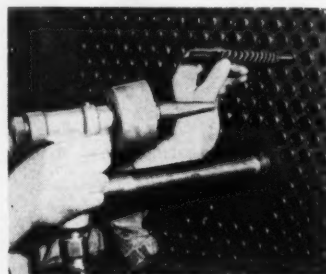
Illustrated 8-page bulletin contains specifications, data covering dry type panel filters recommended for the removal of airborne impurities.

Bul 600 is issued by Dollinger Corp., Dept. CP, 11 Centre Park, Rochester 3, N. Y. Specify CP 6000, pages 2 and 3.

**Condenser tubes cleaned
by nylon brushes
shot from gun**

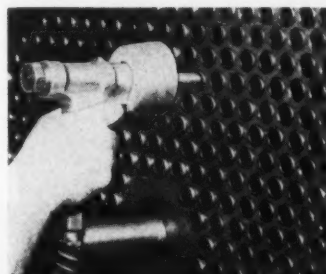
Uses: For cleaning condenser or heat exchanger tubes.

Features: Spiral design of brushes gives them a spinning, scouring motion which, together with flushing action of water from gun, quickly removes sludge and other soft deposits from small tubes as in heat exchangers.



Nylon brush is inserted in tube

Brushes have rubber bumpers or plugs at each end which are of a slightly smaller dimension than tube to permit water to pass and impart spinning action to closer-fitting brush. There is said to be no danger of brushes sticking in tubes or injuring tubes in any way.



Gun is pressed into tube. This action automatically releases water pressure

**SPERRY
HAS THE ANSWERS**

—Whatever Your
Filtration Problems
May Be . . .

During a half century of designing filter presses for America's manufacturing companies, Sperry has solved nearly every known type of industrial filtration problem. Sperry Filter Presses are flexible in size and design . . . there is a complete range of filter bases . . . and a choice of six different closing devices.

Send for the Sperry Filter Press catalog and you'll see why Sperry can solve your filtration problems efficiently and economically.

D. R. SPERRY & CO.

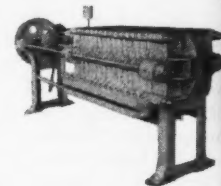
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San Francisco, 4, California
DO 2-0375



When inquiring check CP 6001 on handy form, pgs. 2-3

**SPRACO
NOZZLES**

Write for NOZZLE CATALOG to
SPRAY ENGINEERING CO.
125 CENTRAL STREET • SOMERVILLE 45, MASS.

When inquiring check CP 6002 on handy form, pgs. 2-3

CHEMICAL PROCESSING

We Build Only PUMPS — The Finest of their Kind

APCO
TURBINE-TYPE PUMPS

For the answer to any pumping problem — large or small — lasting dependability and consistent economy — may we suggest that you get acquainted with PUMPS by Aurora. They have pleased thousands. You, too, will like them.

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CENTRIFUGAL PUMPS

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for
CONDENSED
CATALOG "M"

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AURORA
PUMP COMPANY
DIVISION OF THE NEW YORK AIR BRAKE COMPANY
62 LOUCKS STREET, AURORA, ILLINOIS

When inquiring check CP 6003 on handy form, pgs. 2-3

USE THIS NEW SAFETY MATERIAL

ALL OVER
YOUR
PLANT

Work platforms



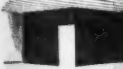
Flooring



Outer Covers



Partitions



Safety

GRIP-STRUT

NON-SKID — RUGGED — LOW COST

Safety Grip-Strut is a new basic material. All one piece, steel or aluminum, in various sizes and gauges. Sold like lumber, used like lumber and stocked in your storeroom like lumber. Ideal for on-the-job fabricating. Not welded, riveted or expanded. It presents an open space, in a diamond shaped pattern, in excess of 75% of the area for ready access of light and air and gives a positive NON-SKID footing in all directions. Ideal for stair treads, fire escapes, cable trays, work platforms, catwalks, flooring and for original equipment safety treads. Your own mechanics can install it — it's inexpensive, yet permanent and safe. Write today for new catalog showing loadings and methods of easy application in your plant.

Distributors in all principal cities.

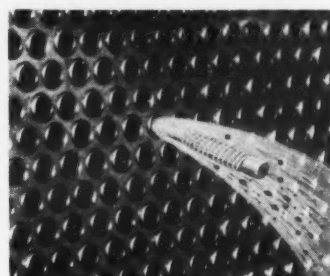
GRIP-STRUT division
THE GLOBE COMPANY

Manufacturers since 1914
4006 S. Princeton Ave. • Chicago 9, Ill.

When inquiring check CP 6004 on handy form, pgs. 2-3

MAINTENANCE

Description: Aluminum Jiffy Gun is operated by inserting brush into tube then pressing nozzle of gun into tube end. This releases water pressure and assures tight fit between tapered nozzle and tube. A shield behind nozzle serves to divert any water which may temporarily back-flow before nozzle makes full contact with tube end.



Brush, propelled by water flow, emerges from other end of tube

Air can be used as operating medium, although water is preferred for its flushing action. Brushes are recovered at other end of tube and used over. In most condensers, it is unnecessary to open water box. Gun can be operated and brushes recovered through hand holes.

(Condenser tube brushes and Jiffy Gun are products of Elliott Co., Lagonda Div., Dept. CP, Springfield, Ohio . . . or for more information check CP 6005 on handy form, pages 2 and 3.)

Presents new NEMA motor standards

Eight-page two-color bulletin gives a tabular presentation of the new NEMA motor frame assignments adopted in May. Tables compare old with new assignments for open type poly-phase, single-phase, and wound-rotor types, as well as totally enclosed fan-cooled types.

Also shown are new and old frame dimensions for foot-mounted and flange-mounted motors, and standards for minimum locked-rotor torque for general-purpose single-phase motors. Bul GEA-5995 is issued by General Electric Company, Dept. CP, Schenectady 5, N.Y. When inquiring specify CP 6006, pages 2 and 3.

WE TAMED EXPLOSIVE FUMES

with this centrifugal

AN **A.T.&M.**
SUCCESS STORY BY
SAM SPINNER

THE FUMES FROM THAT CHEMICAL ARE SO VOLATILE WHEN WE CENTRIFUGE IT, SAM, THAT JUST STATIC OR OVERHEATING WILL EXPLODE THEM!

I KNOW THE CURE FOR THAT!

BUT THAT'S NOT ALL, SAM! ANY METALLIC FRICTION WHICH WOULD NORMALLY TAKE PLACE IS DANGEROUS AND MUST BE ELIMINATED.

I CAN CURE THAT, TOO!

LATER

THE FUME-PROOF HOOD ON THIS STANDARD AT&M MACHINE WILL SEAL FUMES IN-TIGHTER THAN A DRUM. AND—

WE DEVELOPED A SPECIAL TWO-SPEED SELF-BRAKING MOTOR JUST FOR YOUR PARTICULAR PROBLEM WHICH COMPLETELY DOES AWAY WITH THAT FRICTION YOU WORRIED ABOUT. YOU'RE IN THE CLEAR — SAFE AND EFFICIENT!

FREE
ILLUSTRATED
BOOKLET

AMERICAN TOOL & MACHINE COMPANY
1412 Hyde Park Avenue, Boston 36, Mass.

Please send me my free copy of the new AT&M booklet "Centrifugal Force." I am interested in the following processes:

Separation ☐ Extraction ☐ Dehydration ☐ Clarification ☐ Coating ☐
Filtration ☐ Draining ☐ Thickening ☐ Impregnation ☐ Sedimentation ☐

ANY OTHER PROCESS.....

SAVE TIME, SPACE
AND COSTS WITH

A.T. and M.
CENTRIFUGING

Name.....Title.....

Company.....

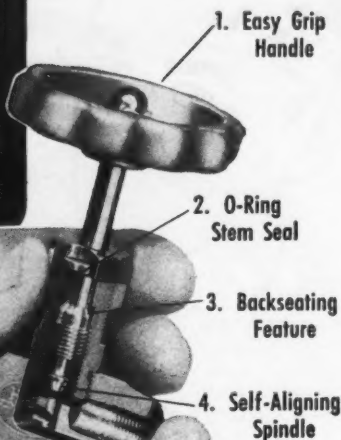
Street.....

City.....Zone.....State.....

When inquiring check CP 6007 on handy form, pgs. 2-3

NEW

HOKE BAR STOCK NEEDLE VALVES with 4 improved design features



1. Easy Grip
Handle

2. O-Ring
Stem Seal

3. Backseating
Feature

4. Self-Aligning
Spindle

The newest and most versatile bar stock needle valve now available—that's the HOKE 270 series for instrumentation, test panel and hydraulic service. The O-ring stem seal provides maximum tightness and eliminates packing adjustments. (Conventional packing is available, however, if desired.) An important new advantage is the backseating feature that permits O-ring or packing replacement under pressure, without shutting down. A self-aligning spindle has been designed to insure tight seating with minimum wear. The easy-grip handle is of die-cast anodized aluminum, with no sharp edges. An additional feature makes possible direct instrument panel mounting. These new bar stock valves are now available in sizes from $\frac{1}{8}$ " to $\frac{1}{2}$ " pipe — straight and angle patterns — manufactured from brass, Type 316 or 430F stainless steel. O-ring styles can be helium leak tested for use in non-critical high vacuum service.

Write for the New Hoke Catalog

This completely illustrated 68-page catalog contains specifications on needle valves of all sizes as well as toggle valves, special purpose valves, fittings and accessories. Tell us about your problem and we will gladly send you a copy of the catalog with our specific recommendations. Address your request to 145 S. Dean Street, Englewood, N. J.

HOKE

**HOKE
INCORPORATED**
Fluid Control Specialists
ENGLEWOOD, NEW JERSEY

When inquiring check CP 6008 on handy form, pgs. 2-3

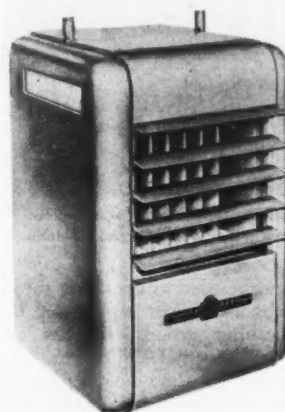
MAINTENANCE

All types of gases suitable for firing unit heaters

Uses: Suited for installation in applications where appearance is important, and where a central heating system may not be available.

Features: Heaters are suitable for use on all types of natural, manufactured, and liquified petroleum gases.

Description: Seven sizes of these gas fired unit heaters are available.



Heat output of unit ranges from 20,000 to 160,000 Btu per hour

able. Heat output ranges from 20,000 to 160,000 Btu per hr, with fan diameters from 12 to 20".

(Products of American Air Filter Co., Inc., Dept. CP, 215 Central Ave., Louisville 8, Ky. . . or for more information check CP 6009 on handy form, pages 2 and 3.)

Story of abrasives

This 312-page book deals briefly with the story of abrasives and the machines developed to use them. More particularly it is the biography of a grinding wheel and a company that was founded because of it. The book is not technical in its approach, although it includes many descriptions of technical processes.

To obtain "The Norton Story" remit \$3.75 direct to the Commonwealth Press, Dept. CP, 44 Portland St., Worcester 8, Mass. When inquiring specify CP 6010 on handy form, pages 2 and 3.

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RECTIFIER
CORPORATION**
EL SEGUNDO
CALIFORNIA

Selenium Rectifiers

Phenolic Cartridge Type

Type F

Type P

CASE
DIAMETER:
From $\frac{1}{4}$ " to $1\frac{1}{4}$ "
LENGTH: From $\frac{1}{2}$ " to 12"
CURRENT, half-wave: 1.5 ma to 60 ma
VOLTAGE, DC output: 20 volts to 200,000 volts
SEND FOR BULLETIN H-1

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NEW YORK: 501 Madison Avenue • Phone: Plaza 5-8665

When inquiring check CP 6011 on handy form, pgs. 2-3

you save 50%
in TANK HEATING and COOLING with
PLATECOIL
(REPLACE PIPE COILS)

- ★ You SAVE 50% in tank SPACE
- ★ You SAVE up to 50% in initial COST
- ★ You have 50% LESS WEIGHT to handle
- ★ You SAVE 50% in maintenance LABOR as plates are changed from outside the tank without dumping solution

... besides all these you get faster heating or cooling. Take advantage of the engineering assistance offered by Kold-Hold to help you with your heat transfer problems.

Send for complete
technical manual and
descriptive Bulletin No. P54

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Tranter Mfg. Inc.
LANSING 4, MICHIGAN

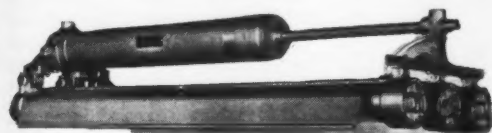
When inquiring check CP 6012 on handy form, pgs. 2-3

Safe, practical lighting provided by explosion- and dust-proof fluorescent fixture

Uses: Wherever the presence of explosive gases or vapors or combustible dusts requires safe, practical lighting.

Features: Fixtures are explosion-proof and dust tight. Each fluorescent lamp is housed in an individual tube of heat-resisting glass. Tube ends are reverse-tapered and sealed into cast aluminum housings which also contain lamp receptacles.

Description: Receptacle housings at ballast ends are pivotally connected to ballast housing. At relamping ends, receptacle housings are fastened to a



Features easy access for relamping

supporting stem assembly which is attached to ceiling or structural building member.

Fixture's reflectors are accurately formed sheet metal of interior white enamel and exterior aluminum finishes. Securely attached by spring clips, they may be easily inserted or removed after fluorescent fixture has been hung.

End-to-end placement of fixture on close centers to other fixtures of its same type (EVF) is said to be simple. A link member that is part of supporting stem assembly allows relamping end of fixture to be lowered several inches for easy access without interference by adjacent fixture.

Type EVF fluorescent lighting fixture is regularly available for straight pendant mounting, but special fittings for 45° mountings are also obtainable.

(Fluorescent lighting fixture is a product of Crouse-Hinds Co., Dept. CP, 1347 Wolf St., Syracuse 1, N. Y. . . . or for more information check CP 6013 on handy form, pages 2 and 3.)




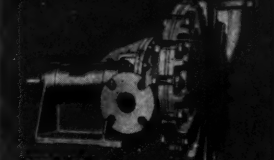

Stainless steel lined reducers make-up to as little as 1 5/8"

Introduction has been made of a stainless steel lined reducing flange designed to permit closer make-up than was formerly possible. Units make-up to as little as 1 5/8" in most sizes.

Reducers are made of cast iron and lined with various types of stainless steel to suit particular process requirements. Belt circles conform with 150# standard drilling. Reducers are manufactured in sizes from 1 x 1/2" to 6 x 4".

(Flanges are a product of Grand Machine & Tool Co., Dept. CP, 692-694 E. Grand Ave., Rahway, N. J. . . . or for more information check CP 6014 on handy form, pages 2 and 3.)

Find the Best Pump for Your Process Job Here—

	TYPE	APPLICATION	SIZE RANGE	SPECIAL FEATURES
 Frame Mounted: 52B6351, 52B6105 Close-coupled: 52B6083, 52B6140	SSB Single suction Frame mounted Grease lubricated Also available close-coupled	General purpose use	Heads to 550 feet. Capacities to 3500 gpm. Temperatures to 250 F.	Available in many materials. Choice of packing, single or double mechanical seal. Bearings protected from corrosive or abrasive atmosphere.
 52B7638, 52B6105 (Multi-stage)	SSB Single suction Frame mounted Oil lubricated	Chemical, petroleum and general purpose use in medium high temperature range	Heads to 530 feet. Capacities to 3500 gpm. Temperatures to 550 F.	Available in many materials. Choice of packing, single or double mechanical seal. Stuffing box cooled above 250 F.
 52B7775	Refinery Type R Single suction Frame mounted Oil lubricated	Volatile liquids and high temperature process applications requiring heavy duty refinery type pump	Heads to 600 feet. Capacities to 1300 gpm. Temperature to 800 F.	Available in many materials. Choice of packing, single or double seals. Stuffing box, bearings, and pedestal may be water cooled.
 52B6615	P and PD Single suction Frame mounted Grease lubricated	Handling fine abrasives in suspension or corrosive liquids	Heads to 260 feet. Capacities to 1300 gpm. Temperatures to 250 F.	Stuffing box on suction side. Choice packing, mechanical seal or Eccobal stuffing box — stops leakage to 15 feet suction head. Open or closed im- peller.
 52B7112 (PW) 52B6381 (CW)	PW — CW Single suction Frame mounted Grease lubricated	Handling slurries and pulp which combine corrosive liquid with suspended solids	Heads to 270 feet. Capacities to 10,000 gpm. Temperatures to 250 F.	Available in many materials. Choice of packing or mechanical seal. Easy to dis- assemble for inspection or repair.

Complete Pumping Unit with Undivided Responsibility

HERE'S what you can get from Allis-Chalmers: Complete pumping unit — pump, drive, motor and control — ready to install and run. You save installation time. All parts are of coordinated design... built to run together. You get one dependable guarantee of satisfaction for complete installation.

Equal is an Allis-Chalmers trademark.

Your nearby Allis-Chalmers District Office representative will be glad to help you with your process pumping problems. Or for complete information on Allis-Chalmers pumps for the chemical industry, write for the bulletins indicated in the table above. Allis-Chalmers, Milwaukee 1, Wis.

ALLIS-CHALMERS



A-4132

When inquiring check CP 6015 on handy form, pgs. 2-3

A NEW PUMP TO DISPENSE FLUIDS FROM DRUMS

Get this NEW
IDEA BOOK!

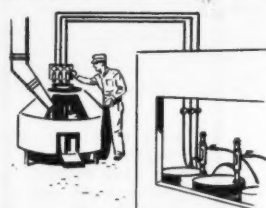
● This illustrated, quick-reading, 24-page book tells you how other users are finding unusual applications for the Fast-Flo pump... where and how you can save time and cut costs pumping fluids from original drums with Graco's amazing Fast-Flo Drum Pump. If your plant deals with fluids, it will pay you to send for your own free copy now!



Filling Product Containers from Original Drums with Fast-Flo is fast and simple. Pump delivers exact desired volume of practically any fluid.



Fast, Clean, Safe Fluid Handling from upright drums is a Fast-Flo specialty. Save space, spillage and hazardous transferring. No more "drippy" spigots!



Pumping fluids to point-of-use with the versatile Fast-Flo saves time. Handy supply outlets increase shop efficiency, and drums can be kept away from working area.

Look around your plant—if you see drums,
you should save money with Fast-Flo

If you handle fluids or semi-fluids from drums, the new Fast-Flo drum pump can help you do a faster, cheaper, cleaner job—whether it's transfer, supply, or a simple mixing operation. Send now for your free copy of the Fast-Flo idea book.



GRACO

Fast-Flo DRUM PUMP

GRAY COMPANY, INC.

12 Grace Square • Minneapolis 13, Minnesota

Regional Offices: New York, Philadelphia, Detroit, Atlanta, Chicago, San Francisco

When inquiring check CP 6016 on handy form, pgs. 2-3

MAINTENANCE

**Hydraulic control used
to save blade on
concrete saw**

Uses: Concrete saw is used before breaking out concrete or asphalt for plant floor patch work, for cutting utility line trenches, and for sawing openings for new machinery bases.

Features: Unit incorporates hydraulic control for lowering blade as a means of providing longer blade life.

Description: Dash board controls on saw make possible every cutting operation by operator from his place behind the machine. Depth control lock allows cutting to a predetermined depth. Friction-type foot brake holds saw on hills or inclines. Dual blade shaft makes possible placement of blade on either side for sawing in corners or confined areas. Automatic "floating action" of saw wheels prevents any binding or tilting of blade when saw is operated on uneven or broken surfaces.

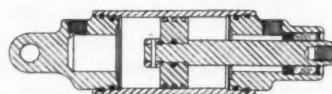
(Concrete saw is a product of Dept. 218, Eveready BrikSaw Co., Dept. CP, 1509 S. Michigan Ave., Chicago 5, Ill. . . or for more information check CP 6017 on handy form, pages 2 and 3.)

**Safety factor of 6 to 1
permitted by hydraulic
cylinder design . . .**

small diameter and length do not sacrifice strength

Uses: For hydraulic cylinder applications requiring up to 8" bore or 18 ft stroke.

Features: Design permits cylinder to be smallest in diameter and length at no sacrifice in strength,

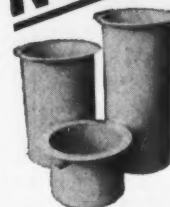


Sectional view shows integral construction

according to manufacturer. Design offers a safety factor of 6 to 1 in all bore sizes.

Description: Meehanite rod bearing on improved key-type hydraulic cylinder is long, providing a full one to one surface for extra

NOW! IOLYTE LAMINATED CROCKS



- PRACTICALLY UNBREAKABLE
- CHEMICALLY RESISTANT
- LIGHTWEIGHT
- INEXPENSIVE
- NOT TAPERED

*Trade mark of
Owens-Corning
Fiberglas Corp.,
Toledo, O.

Available from Stock — PRICE LIST

GAL. CAP.	OUTS. DIAM.	OUTS. HGT.	LIST COST	GAL. CAP.	OUTS. DIAM.	OUTS. HGT.	LIST COST
5	9"	18"	24.00	30	18"	28"	49.00
10	9"	36"	30.00	40	18"	36"	59.00
10	16"	12"	28.00	50	18"	48"	69.00
12	16"	14"	30.00	27	22"	18"	49.00
15	16"	18"	35.00	30	22"	20"	53.00
20	16"	24"	40.00	55	22"	36"	70.00
30	16"	36"	49.00	73	22"	48"	83.00
40	16"	48"	59.00	55	28"	22"	76.00
14	18"	12"	35.00	95	28"	36"	98.00
20	18"	18"	40.00	125	28"	48"	125.00
26	18"	24"	45.00				

Distributor Territories Open

Order from us or from your distributor. Unless rated firm, payment with order. No C.O.D.'s. All prices FOB, L.I.C.
Ask about Iolyte Ducts, Stacks, Tanks, Hoods, etc.

SCHORI PROCESS DIVISION

FERRO-CE CORPORATION

8-10 43RD ROAD, LONG ISLAND CITY 1, N. Y.
FACTORY: 59-31 54TH STREET, MASPETH, L. I.

When inquiring check CP 6018 on handy form, pgs. 2-3

NO RODDING NECESSARY!



Strahman
RAM TYPE
Drain Valves

**The Only Drain Valve
That Cannot Clog Up!**

In the closed position the piston or ram extends up into the tank, preventing plugging of the outlet.

In the open position with piston fully retracted, there is no resistance to flow of materials drained from the tank.

Made in any cast metal to meet your requirements.

Designed for bolting to existing flanges. For special adaptations and for jacketed vessels adaptor pads are available.

Full
Specifications
on
Application

STRAHMAN VALVES, INC., 16 HUDSON STREET
NEW YORK 13, U.S.A.

When inquiring check CP 6019 on handy form, pgs. 2-3

CHEMICAL PROCESSING

MAINTENANCE

wear. Chevron-type packing is replaced easily and whole bearing insert is held by locking snap ring at rod end.

Cast steel mounts are standard equipment and are an integral unit combined with head and rod caps of cylinder. These head and mount combinations are easily disassembled by removing internal locking key ring which unites head and cylinder wall. There are no bolts used in this construction, eliminating possibility of loosening.

Heavy wall tubing, chrome plated rods, rod scraper and milled wrench flats on rods are standard in all cylinders. Cylinder heads are locked in place in a counter-bored section of tubing wall at ends of cylinder. Pipe ports can be oriented at random due to 360° rotation of ends which is made possible by key-type construction. Sizes available are 1½ through 8" bores with a stroke of any length up to 18 ft. All standard mounts are available.

(Product of Carter Controls, Inc., Dept. CP, 2838 Bernice Rd., Lansing, Ill. . . . or for more information on manufacturer's product, reader may simply check CP 6020 on handy form, pages 2 and 3.)

Mathematics aid for engineers

Prepared for those in civil, mechanical, and electrical engineering fields, pocket-size data book contains sections on Mathematical reviews, log tables, natural trigonometric functions, conversion tables, functions of numbers, etc. Mathematical review section contains more than 200 equations on algebra, analytical geometry, trigonometry, differential and integral calculus. The 334-page manual is index tabbed.

"Manual of Mathematics" is available by remitting \$2.25 to the Lefax Publishers, Dept. CP, 9th and Samson St., Philadelphia 7, Pa.

For more information on product at right, specify CP 6021 . . . see information request blank between pages 2 - 3.

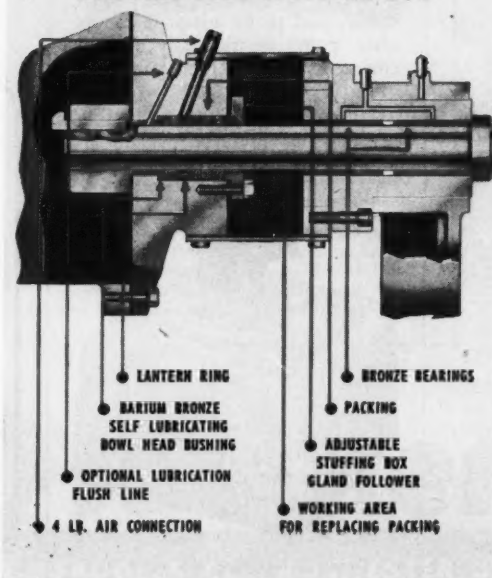
DAY

means longer life span



DAY Imperial Mixer installed at Woodall Industries, Detroit, Mich.

AIR SEAL TYPE STUFFING BOX



* Built for heavy duty, engineered for precision . . . this combination makes DAY's Imperial Mixer extra long-lasting and serviceable. It has been re-engineered with major advances in design, assuring fast, thorough dispersion mixing of heavy plastics and colors in paints and inks, as well as sludge reclamation in paints and enamels.

Shown at left is one of the Imperial Mixer's most valuable features . . . the Air Seal Type Stuffing Box. Pneumatic pressure at 4-10 lbs. protects your product against contamination by lubricants and guards bearings from damage by abrasive mixtures. CO₂ may be substituted for air. For details, call your nearest J. H. Day field engineer or write for Bulletin 600.

when you buy **DAY** you buy dependability

THE J. H. DAY COMPANY
INCORPORATED
1141 HARRISON AVENUE • CINCINNATI 22, OHIO

PRODUCERS OF QUALITY EQUIPMENT FOR BAKING • PAINT & VARNISH • CHEMICAL FOOD • CANDY • RUBBER • CERAMICS • PHARMACEUTICALS • COSMETICS • SOAP PAPER & PULP • MILK PRODUCTS • EXPLOSIVES • SUGAR • OTHER MAJOR INDUSTRIES

In The
"Buffalo"
Fan Balancing
Room.



**THE IMPORTANCE
OF MAINTAINING
BALANCE OF FAN
WHEEL**



PROBLEM:
excessive vibration in exhaust fan delivering dust-laden air to cyclone. Fan operated smoothly a number of years, but gradually developed vibration and finally damaged the bearings.

"BUFFALO" IDEA FILE



SOLUTION: Fan Wheel found to be far out of balance due to uneven buildup of slightly moist dust particles on blades. Fan rotor had never been cleaned, and had condition been permitted to continue, further bearing troubles and a sprung shaft might have resulted. "Buffalo" representative advised owner to clean rotor every six months, then check wheel balance. Fan has since operated smoothly, and with no further bearing trouble at greatly reduced noise level. **NOTE:** all "Buffalo" fan rotors are balanced both statically and dynamically on precision balancing machines at the factory. Regular periodic cleaning and repainting followed by a balance check will assure added years of smooth, efficient performance.

BUFFALO FORGE COMPANY

524 Broadway Buffalo, N. Y.
PUBLISHERS OF "FAN ENGINEERING" HANDBOOK
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.
Sales Representatives in all Principal Cities

VENTILATING
FORCED DRAFT

AIR CLEANING
COOLING

AIR TEMPERING
HEATING

INDUCED DRAFT EXHAUSTING
PRESSURE BLOWING

When inquiring check CP 6022 on handy form, pgs. 2-3

MAINTENANCE

Report on rosin core solder features

Four-page bulletin describes rosin core solder which is available in a variety of wire sizes, compositions, and quantities. Text also includes discussion of features of this solder.

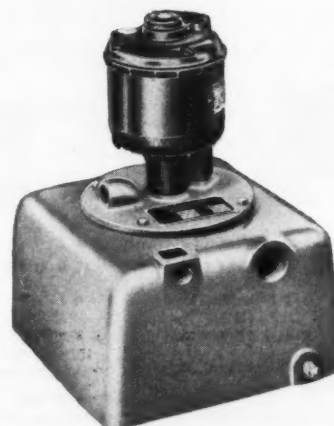
Bul 158 is issued by Federated Metals Div., American Smelting and Refining Co., Dept. CP, 120 Broadway, New York 5, N. Y. When inquiring specify CP 6023 on handy form, pages 2 and 3.

Simplified construction, compactness featured on condensate return pump

Uses: For condensate return pumping applications.

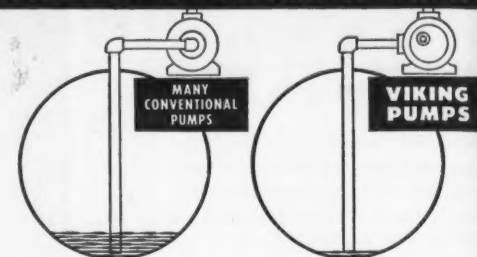
Features: Pump is reported to be extremely compact (occupies less than 1½ sq ft of floor space), has a low condensate return inlet (less than 7" from floor), and has design features which have simplified the construction.

Description: Entire motor, pump, and switch assembly can be lifted out for inspection or service, with no special tools necessary. Counterweight operated switch is in motor housing — no wiring or adjustment required. Discharge may be rotated to any of four 90° positions. Power is ¼ hp drip-proof electric motor, said to be adequate to operate pump continuously in any emergency. Submerged pump has



Occupies less than 1½ sq ft of floor space

GETTING TO THE BOTTOM OF THINGS



The difference to you between profit and loss can depend upon the simple, positive action of Viking Rotary Pumps. Their fast, thorough stripping action can mean that you get all you pay for when emptying barrels, tanks and other containers instead of leaving a part of each load. Where many other pumps fail, efficient stripping is possible with Vikings because of the suction lift created by our famous Viking "gear-within-a-gear" pumping principle.

Whether the liquid you want to pump is thick or thin, you will pump more... faster with a Viking. What is your pumping problem? Send it along today and ask for bulletin 54SCC.

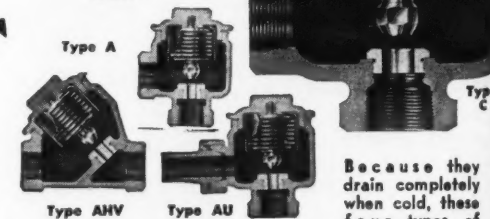


VIKING PUMP COMPANY
CEDAR FALLS, IOWA

When inquiring check CP 6024 on handy form, pgs. 2-3

NICHOLSON MAKES FREEZE-PROOF Steam Traps

for Every Plant
Use



Because they drain completely when cold, these four types of Nicholson steam traps are positively freeze-proof. Can be freely installed outdoors. Universally recommended for use in lines which need not be in continuous use during cold weather, because they are freeze-proof and because their 2 to 6 times average drainage capacity results in minimum heat-up time. The non-air-binding feature of Nicholson traps also notably facilitates heat transfer in severe weather. Sizes ¼" to 2"; pressures from vacuum to 250 lbs.

BULLETIN 853
181 Oregon St.
Wilkes-Barre, Pa.

W. H. NICHOLSON & CO.
TRAPS · VALVES · FLOATS

When inquiring check CP 6025 on handy form, pgs. 2-3

CHEMICAL PROCESSING

MAINTENANCE

a closed brass centrifugal impeller with no close clearances.

Seal-less construction eliminates all packing glands, rotary seals, and O-rings. A simple overflow connection takes the place of the usual vent and is so designed that it cannot be plugged.

Pump comes in two style tanks — Series 5200 with cast iron tank; and Series 5100 which is identical in operation and features, but has a fabricated steel tank. Capacity — 3000 sq ft edr, 4.5 gpm, operates up to 20 lb discharge pressure without any adjustment.

(Lowboy condensate return pump is a product of Sterling, Inc., Dept. CP, 3738 N. Holton St., Milwaukee, Wis. . . . or for more information check CP 6026 on handy form located between pages 2 and 3.)

Built-in valve featured on air cylinder

Manufacturer has announced a line of air cylinders featuring a built-in operating valve. This type cylinder is said to eliminate one pipe con-



Available in cylinder diameters of 1½ through 6"

nection usually required for a double-acting cylinder and increases efficiency of cylinder by reducing line friction.

Integral valve is of universal type furnished so it can be operated by miniature poppets, direct or remote, or converted to single or double solenoid operation. Valve can be furnished with dual speed controls. Cylinder diameters are sized from 1½ through 6".

(Air cylinders are a product of Carter Controls, Dept. CP, 2838 Bernice Rd., Lansing, Ill. . . . or for more information check CP 6027 on handy form, pages 2 & 3.)

For more information on product at right, specify CP 6028 . . . see information request blank between pages 2 - 3.

now



FLEXIBLE STANDARDS for Pfaudler Stainless Steel Heat Exchangers



Pfaudler Data Book to help you save time on heat exchanger calculations

This 40-page, fact-packed manual is designed to help you solve heat exchanger problems. Contains all the data you need to work out capacity and type—arranged in easy-to-follow tables, curves and charts. Full details on Pfaudler heat exchangers. It's a basic working handbook which no one concerned with heat exchange should be without. Just mail the handy coupon for your copy.

Design features previously associated only with custom-built heat exchangers are now available at competitive standard cost under Pfaudler's new system of flexible standards.

For a given heat transfer area, you may select the most applicable combination of length and diameter. Further, nozzles can be of any size and in any position and can be either threaded or flanged. This flexible standards program applies to fixed tube sheet, single or multi-pass, tube and/or shell side stainless steel units in diameters up to 10".

RAPID DELIVERY through Production Line Methods

Under present conditions, flexible standard units can be delivered in from 4 to 8 weeks after the receipt of your order, always considering first our obligations under our country's allocation and ratings programs. Fastest deliveries are obtainable in the smaller sizes (4½" to 6"). These rapid deliveries are possible because we carry a stock of tube sheets, bonnets, nozzles, tubes, baffles, etc., ready for assembly to your specifications.

Pfaudler

THE PFAUDLER CO., ROCHESTER 3, N. Y.
ENGINEERS AND FABRICATORS OF CORROSION RESISTANT PROCESS EQUIPMENT
GLASS-LINED STEEL — Hastelloy • Aluminum • Tantalum • Teflon
Carbon Steel • Solid or Clad Stainless Steel • Nickel • Inconel • Monel

THE PFAUDLER CO., Dept. CP1, Rochester 3, N. Y.

Please send me the Pfaudler Heat Exchanger Manual No. 837

Name _____

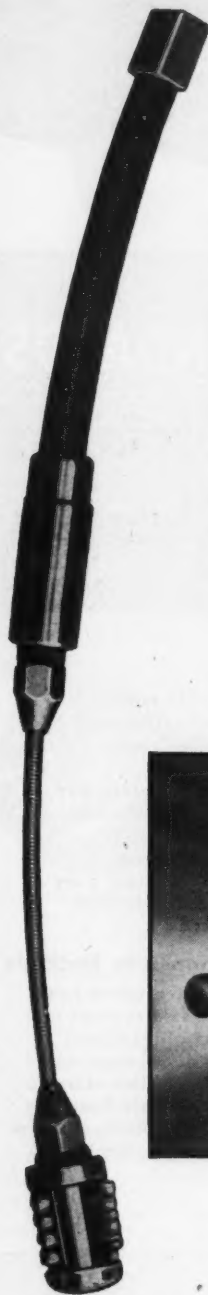
Title _____

Company _____

Address _____

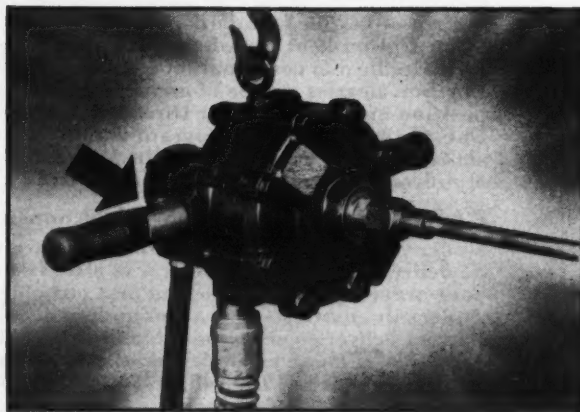
City _____ Zone _____ State _____

Small tubes clean easy the **LAGONDA** way!



Any tube from 1/2 in. ID up whether curved or straight, becomes an easy, quick job when you put the right Lagonda cleaner to work. If it's curved, the 600 Series (shown at left) with its slim powerful motor and any one of the many brushes or cutter heads adapted to it, will get around even short-radius curves and leave the tube clean as a whistle. If it's straight, use another 600 Series type, or the Lagonda suspension type cleaner (illustrated below), in which the motor can be air or steam-driven, or electric. Trigger control gives instant speed-up the moment the cutter or drill enters the tube. Controls water supply too.

Lagonda cleaners come in sizes for cleaning anything up to 20 in. pipe.



Get the latest dope on tube cleaning methods — contact your local Elliott representative, or write for bulletin to Elliott Company, Springfield, Ohio.

ELLIOTT Company

STEAM TURBINES • MOTORS • GENERATORS • HEATING HEATERS • ELECTRIC • CONDENSERS • CENTRIFUGAL BLOWERS • TURBOCHARGERS • TUBE CLEANERS • STRAINERS

LAGONDA DIVISION



When inquiring check CP 6029 on handy form, pgs. 2-3

MAINTENANCE

Tubing can be tested in troubleshooting, before operation

Uses: Tubing test plugs are for use anywhere that it is desirable to shut off the end of a tube temporarily. They are said to be especially convenient for use in instrumentation, radiant heating, refrigeration, LP gas, and similar installations.

Features: Plugs make it possible to test tubing installations before they are put in service or when troubleshooting for leaks.

Description: Plug is inserted in end of tube and wing nut is tightened. This expands synthetic rubber portion of plug and seals tube. It is stated that these plugs will hold pressures up to 100 psi and can be used on all liquid or gas



Tubing test plug will hold pressures up to 100 psi

tubing lines except those where material conveyed would deteriorate synthetic rubber. Plugs are available in five sizes: 1/4, 3/8, 1/2, 5/8, and 3/4" OD.

(Tubing Test Plug is a product of Imperial Brass Mfg. Co., Dept. CP, 1200 W. Harrison St., Chicago 7, Ill. . . . or for more information check CP 6030 on handy form, pages 2 and 3.)

Contains specs on line of oil-free compressors

Specifications on company's complete line of non-lubricated air compressors from 172 to 8800 cfm, 25 to 600 hp are included in bulletin. A heavy-duty, vertical compressor, Model WGO-9, is featured. Design and construction data are detailed. (8 pages)

Bul A-44 is issued by Joy Mfg. Co., Dept. CP, Oliver Bldg., Pittsburgh 22, Pa. When inquiring specify CP 6031 on handy form located between pages 2 and 3.

LOW SPEEDS AT RIGHT ANGLE



U.S. SYNCROGEAR MOTOR

20 to 155 RPM — 1/4 to 3 HP Request Bulletin

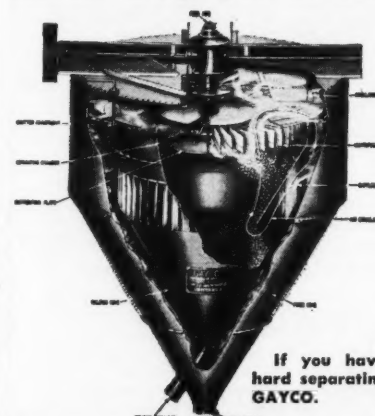
U.S. ELECTRICAL MOTORS Inc.

BOX 2058, LOS ANGELES 54, CALIFORNIA MILFORD, CONN.
When inquiring check CP 6032 on handy form, pgs. 2-3

GAYCO CENTRIFUGAL SEPARATORS

GAYCO Separators, equipped with the adjustable centrifugal sizing fan — an exclusive GAYCO feature — make closer separations. Closer separations bring about higher production through efficient removal of the fines made by the mill. Closer separations bring about higher quality products by eliminating all undesirable oversize.

"TIMKEN BEARING EQUIPPED"
GAYCO brings you all these:



Range 60 to 400 mesh
greater capacity
25 to 30% greater production
Cleaner Tailings
Uniform Products
Slow speed for slow wear
Quick and easy adjustments

If you have an exceptionally hard separating problem, TRY THE GAYCO.

Universal Road Machinery Co.

Robert M. Gay-Division

Factory and Laboratory, Kingston, N. Y.

117 LIBERTY STREET

NEW YORK 6, N. Y.

Canadian Representative: F. H. Hopkins & Co., Ltd.,
8500 Decarie Blvd., Montreal, Que.

When inquiring check CP 6033 on handy form, pgs. 2-3

Building Block design featured on oil-tight push-button line

Company's line of oil-tight push-buttons, with special emphasis on color ring identification and building block combinations, is described in eight-page, two-color bulletin. More than 35 photographs and drawings illustrate line's flexibility, its maintenance, and various types of units and switches that are available. Also included are ratings and dimension diagrams.

Bul GEA-5779 is available from General Electric Co., Dept. CP, One River Rd., Schenectady 5, N. Y. When inquiring specify CP 6034 on handy form, pages 2 and 3.

Compact size of circuit breaker saves mounting space

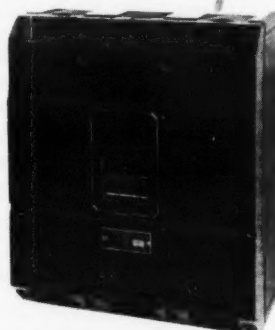
Manufacturer has announced "J" frame circuit breaker said to be more compact than former 225 amp design without sacrificing any protective features. Measuring only 9" wide by 11" long by 5½" deep (including handle), unit saves space in switchboards, distribution-type panel-boards, power panels, bus plugs, combination motor starters, and individual enclosures. Reduced size allows "double-butt" mounting in convertible panel boards.

Design features include enclosed terminals that provide safety and reduce possibility of phase-to-phase faults. External instantaneous trip adjustment provides five separate instantaneous trip-point settings. Solderless, pressure-type cable connectors allow quick and easy cable hook-up. Rear connection studs simplify switchboard mounting.

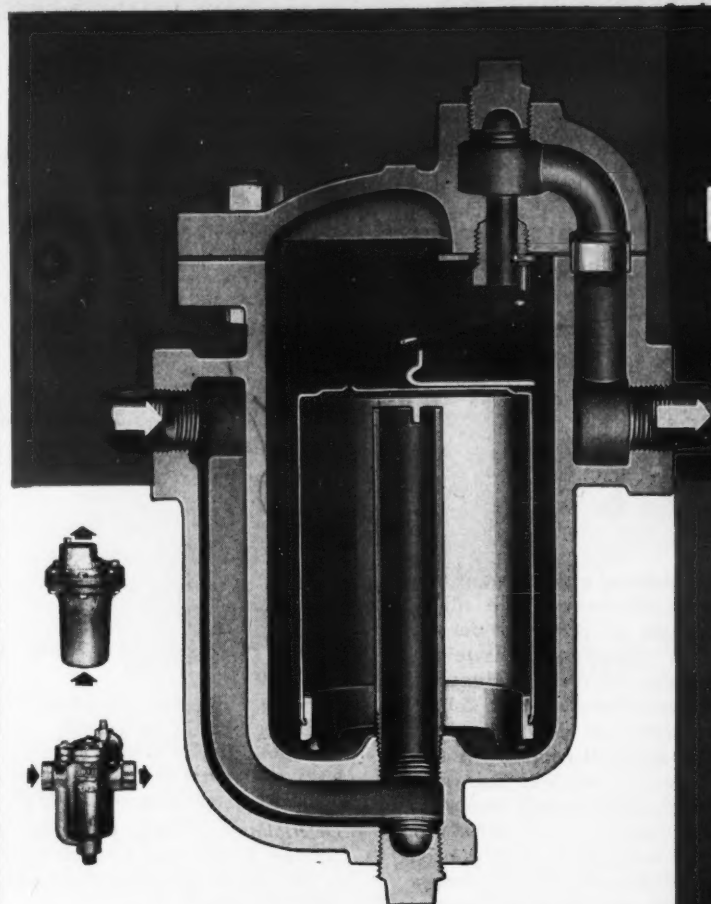
Unit is a thermal-magnetic circuit breaker with quick-make, quick-break operating mechanism. Common trip operation is retained; an overcurrent on any pole opens all poles simultaneously. Extra auxiliary devices such as shunt trips, undervoltage trips, auxiliary and alarm switches are internally mounted within breaker case. Breaker is UL approved, factory-calibrated and sealed to prevent tampering.

Circuit breaker is available in ratings from 70-225 amp, 2- and 3-pole, 600 v AC, 250 v DC, 15,000 amp interrupting.

(Circuit breaker is a product of Small Air Circuit Breaker Div., I-T-E Circuit Breaker Co., Dept. CP, 19th and Hamilton St., Philadelphia 30, Pa. . . or for more information check CP 6035 on handy form, pages 2 and 3.)



Unit measures 9" wide by 11" long by 5½" deep



Two-phase steam trap leverage is an original development by Armstrong and has been incorporated in Armstrong traps since the memory of most engineers runneth not to the contrary. It provides:

1. High initial leverage to open the valve against pressure.
2. Secondary lower leverage which permits the valve to travel well clear of the seat to minimize restriction to flow of condensate.

A single-phase lever can open just as large a valve or give just as great valve travel, *but not both*. Thus, Armstrong two-phase leverage gives very much greater capacity, depending on trap size than the earlier leverage system.

No steam trap gives greater actual hot condensate capacity, size for size, and dollar for dollar, than an Armstrong!

For complete data call your local Armstrong Representative or send for the 44-page Steam Trap Book.

ARMSTRONG MACHINE WORKS
880 Maple Street, Three Rivers, Michigan

ARMSTRONG STEAM TRAPS

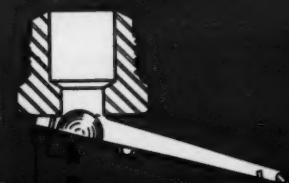
When inquiring check CP 6036 on handy form, pgs. 2-3

MORE TRAP CAPACITY PER DOLLAR with Armstrong two-phase leverage

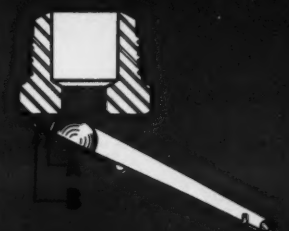
HOW IT WORKS:



1. Valve in closed position.



2. As the bucket starts to sink, the lever fulcrums at "A", giving high leverage to open the valve against pressure. When valve is well open, the secondary fulcrum "B" touches the face of the valve seat.



3. Additional bucket travel results in fulcrum "B" becoming the pivot, permitting the valve to be opened wider so that restriction to flow of condensate is minimized.



Maintenance Engineers responsible for dust and fume removal — air handling should know about — **SPIRATUBE®**



You're missing a good bet, if you haven't discovered the many advantages of Spiratube for all ducting systems. Lightweight Spiratube, the flexible ducting, costs less to install in both dollars and production down-time, for you can install it yourself — move it where you need it! Spiratube connects quickly and easily to present lines — bends anywhere. No turn is too short, no angle too acute. No elbows or special fittings to bother with in going around obstructions.

Standard sizes with various fabrics and coatings for all requirements are immediately available from well-stocked distributors — coast-to-coast.

◀ SPIRATUBE application in traveling blow ring assembly at B. F. Goodrich Chemical Company Plant, Louisville, Kentucky.

write today for full details
on Flexible's amazing
cost-saving ducting

*Flexible
Tubing*

CORPORATION
Gulfport, Connecticut Pasadena 1, California

When inquiring check CP 6037 on handy form, pgs. 2-3



VISIT OUR
BOOTH #831

ENGINEERING & MAINTENANCE

Catalog-in-brief describes steam cleaner line

All six sizes of manufacturer's steam cleaner line are pictured and described in four-page catalog. It tells concisely the difference between fireless, steam vapor and high-pressure combination models; gives info on size of cleaner to fit work load; contains a chart of pressures, temperatures and volumes; and lists standard accessories. Units described handle pressures from 100 to 400 psi, temperatures to 325°F and volumes from 110 to 2100 gph.

Cat 150-R is available from Malsbary Mfg. Co., Dept. CP, 845 92nd Ave., Oakland 3, Calif. When inquiring specify CP 6038 on handy form, pages 2 and 3.

Sweeps two acres an hour and dumps fast

Uses: For motorized sweeping of open and congested areas.

Features: Machine is said to sweep over 100,000 sq ft per hour in open areas. Dumping operation takes only 30 sec. With a few turns of a ratchet-type lever, operator can tilt fully loaded dirt hopper and dump loads weighing up to 700 lb.

Description: Designated as Model 75, sweeper is powered by a 7.3 hp air-cooled gas engine. Drive is through a 5/8" pitch chain and hardened alloy steel bevel gears.

Machine sweeps a 36" path. Rotary side brush increases sweeping path to 48" and allows cleaning flush with walls, curbs, fences, and under guard rails.

Clutch on unit allows instant forward-reverse travel. There are no gears to shift. Other standard equipment includes an auto-type battery, built-in generator, and push-button starter.

(Sweeper is a product of G. H. Tennant Co., Dept. CP, 2566 N. Second St., Minneapolis 11, Minn. . . or for more information check CP 6039 on handy form, pages 2 and 3.)

Need for sealing "goop" over bolts made obsolete by non-directional, re-usable sealing device

Uses: For safe, sure sealing of bolts and studs with either high or low pressure gas, liquids, or air.

Features: Seal is said to obsolete need for putting "goop" over bolts or studs. It does not require high fastening torques to seal as there is always a full metal to metal contact without any load transference to sealing gland. With these re-usable seals, there is never loss of sealing from "cold flow," according to manufacturer.

Description: Stat-O-Seal uses principle of controlled confinement of sealing gland. It is of one-piece construction and non-directional. It cannot be

for *Low*
**VACUUM PUMP
MAINTENANCE
COSTS and BETTER
VACUUM . . .**

It's the

HILCO OIL RECLAIMER

**VACUUM
for PUMP
USERS . .**



A simple, economical and efficient method of restoring contaminated lubricating and sealing oil to the full value of NEW OIL. The HILCO will produce and maintain oil free of solids, gums, water and gases in a continuous, all-electric, automatic operation.

**Be SURE of clean oil in your
HIGH VACUUM PUMPS**

**HILCO
OIL RECLAIMER
SYSTEMS . .**

• **WRITE FOR COMPLETE DETAILS
IN THE FREE BULLETIN**
Recommendations at no Obligations

**THE HILLIARD
CORPORATION
PUMPS DIVISION**

58 W. Fourth St., Elmira, N. Y.

HILCO - For Sealing Bolts

**IN CANADA — UPTON - BRADEEN - JAMES, Ltd.
990 Bay St., Toronto, 3464 Park Ave., Montreal**

When inquiring check CP 6040
on handy form, pgs. 2-3

CHEMICAL PROCESSING

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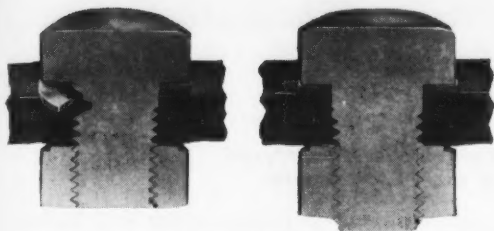
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Cutaway view shows device before sealing (left) and after sealing

assembled upside down. O-ring sealing gland in seal is mechanically fastened to metal retainer, eliminating possibility of failure of a chemical bonding agent. Use of seal is said to save time, effort, and mal-assembly.

(Sealing device is a product of Franklin C. Wolfe Co., Dept. CP, 3644 Eastham Dr., Culver City, Calif. . . or for more information check CP 6041 on handy form, pages 2 and 3.)

Release agent increases mold life and will not discolor parts

Uses: For release of polyester and epoxy resins, and for phenolic, melamine, and similar materials.

Features: Because parts release quickly, mold does not need to be lubricated as often and its life is increased, according to manufacturer.

Product is said to have proved of particular value because it is crystal clear and does not discolor jet blacks, ivory, and other colors. No buffing or polishing is required. No oily film or burnt areas are left on articles.

Description: Mold Release B is fast drying and can be easily applied by brushing, spraying, or wiping with a cloth dampened in solution. It does not contain powders, mineral oils, or waxes which are messy and difficult to apply uniformly.

Material is a clear liquid. One squirt from spray gun and surface is lubricated. Molds can be closed instantly, it is reported.

(CD Mold Release B is a product of Chemical Development Corp., Dept. CP, Danvers, Mass. . . or for more information check CP 6042 on handy form, pages 2 and 3.)

Includes specs on plastic features, applications

Illustrated, 8-page brochure presents manufacturer's complete line of plastic products. These include: plastic tubing, gaskets, extrusions, and pipe. One page gives tables and definitions on plastic terms and applications.

Bul 150 is issued by Yardley Plastics Co., Dept. CP, 142 Parsons Ave., Columbus 15, Ohio. When inquiring specify CP 6043, pages 2 and 3.



This is one of the two 29-year-old Cleveland worm gear speed reducers driving rubber calenders in the United States Rubber factory at Chicopee Falls, Mass. **WORM GEARING**—universal in its application—affords advantages for almost every power transmission job. Whether you want worm gearing sets or speed reducer units, you will find drives to meet your need in the complete Cleveland line.

Twin CLEVELANDS drive rubber calenders 217,157 hours

HERE'S eloquent testimony to the long wear in Cleveland's: In 1924 the United States Rubber Company installed two Cleveland worm gear speed reducers to drive two rubber calenders. In 1953, some 217,157 work hours later, these same two units are still performing their jobs as efficiently and economically as the day they were first put into service. Throughout these 29 years, these Cleveland have operated 24 hours around the clock, except Sundays.

This dependable, low-cost performance has influenced the management of this company to install other Cleveland drives on other calenders.

You'll find Cleveland worm gear speed reducers delivering the same outstanding service throughout the chemical and allied industries, driving conveyors, agitators, dryers, kilns—wherever a rugged right angle drive is needed—one that transmits power quietly, smoothly and evenly.

Whatever your power transmission problems, you will find ready solutions in Cleveland drives. Write today for new Catalog 400. The Cleveland Worm & Gear Company, 3257 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.



CLEVELAND

Worm Gear

Speed Reducers

When inquiring check CP 6044 on handy form, pgs. 2-3

WHEN BINS BECOME BOTTLENECKS... YOU NEED SPO AIR VIBRATORS



Don't let arching, bridging and clogging bottleneck your production... keep materials flowing from bins, hoppers and chutes with SPO air vibrators. These low-cost units deliver powerful hammer-like blows which eliminate jamming of powdered and granular materials.

Exclusive feature of SPO air vibrators is a special corrosion-proof bronze alloy cylinder liner which assures full-power start, high-speed operation, low air consumption and maximum service life.

1252-58

Write today
for Bulletin 50.



SPO INCORPORATED

6531 GRAND DIVISION AVE. • CLEVELAND 25, OHIO

When inquiring check CP 6045 on handy form, pgs. 2-3



Ceilcrete
a stonelike corrosion proof
trowelled on surface

✓ ACID PROOF
✓ ALKALI PROOF
✓ SOLVENT PROOF

**TOPPING for FLOORS • WALLS
ACID HOLDING TANKS • WASTE
DISPOSAL SYSTEMS, ETC.**

THE CEILCOTE COMPANY
4832 Ridge Road, Cleveland 9, Ohio

Send for technical data
on its application, corrosion
resistance properties



When inquiring check CP 6046 on handy form, pgs. 2-3

WHEN PUMPS WEAR OUT...WHO IS AT FAULT?

CHECK PUMP CAPACITY

Your automobile may be engineered for 100 miles an hour speed, but operating at "cruising" speeds provides you with many more miles of trouble-free motoring. It's the same with a Waukesha P.D. Sanitary Pump. Operating at peak capacity shortens its life.

Of course, the best safeguard is to engineer your installation carefully beforehand, so that your choice of pump has sufficient capacity to handle any variation in your line above the "average." Remember, also like any mechanical device your pump is subject to wear, chambers become larger, with consequent loss in capacity. So this should be compensated for in planning — along with known factors of quantity of product to be moved, viscosity of

product, vacuum, head pressure, amount of piping, bends and elbows, check valves and screens — and any other details affecting pumping capacity.

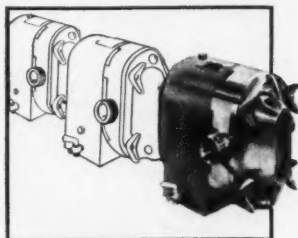
So, to keep pump maintenance down, watch your load factors and avoid

overloading. If your pump is operating at its peak now, re-check your system to see if it can be rearranged to bring it down to the pump's "cruising" range. Write for latest Instruction Hand Book — or new catalog.

Waukesha P. D. Sanitary Pumps
In a wide Range of Capacities

Whether you need 100 or 60,000 lbs. per hour pumping capacities, there's a Waukesha P.D. Sanitary Pump to fill your needs exactly. V-belt drives, Variable Speed models with Reeves or U.S. Vari-drive — they all provide product protection in non-aerating, non-agitating, non-recirculating pumping efficiency.

*P.D. — Positive Displacement — Slow Speed



Waukesha 100%
SANITARY
PUMPS

Dependable Product of a Responsible Manufacturer

WAUKESHA FOUNDRY COMPANY 1344 LINCOLN AVENUE
WAUKESHA, WISCONSIN

When inquiring check CP 6047 on handy form, pgs. 2-3

New Literature

Inorganic solids analysed by mass spectrometer

Illustrated 40-page bulletin studies analytical applications of mass spectrometry. Special problems of spectrometer design and techniques required for analysis of inorganic solids are discussed as well as results obtained in various specific applications. Material was originally presented at 54th Annual Meeting of the American Society for Testing Materials. Photographs, tables, graphs and charts are included.

Bul 149 is available by remitting \$1.25 direct to American Society for Testing Materials, Dept. CP, 1916 Race St., Philadelphia 3, Pa.

All kinds of switches

Comprehensive illustrated catalog shows telephone-components for industrial use. Photographs and diagrams illustrate switches, impulsing devices, switchboard lamps, jacks, and caps. Specifications and general data are included.

Cat 4018-D is issued by Automatic Electric Sales Corp., Dept. CP, 1033 W. Van Buren St., Chicago 7, Ill. When inquiring specify CP 6048 on handy form, pages 2 and 3.

Real mixed up samples in two minutes

Seven-page booklet explains how recently developed mixer can produce homogeneous dry blend in less than 2 minutes. It also deals mode of operation, other measurements of performance, and applications of the mixer.

Bul FS-238 is issued by Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. When inquiring specify CP 6049 on handy form, pages 2 and 3.

Color films in three languages help train lathe operators

Three 16mm sound films in full color, which are available for loan to industries for training lathe operators, are described in bulletin. English, French, and Spanish dialog sound tracks are available.

Films make a series. First, The Metalworking Lathe, introduces lathe to beginner — parts and operations are presented. Second, Plain Turning, shows all operations necessary to

machine a shaft. Third film, Grinding Cutter Bits, portrays correct way to grind tools for different lathe operations. Showing time for each film is approximately 20 min.

Film Bul 5230 is available from South Bend Lathe Works, Dept. CP, 425 E. Madison St., South Bend 22, Ind. When inquiring specify CP 6050 on handy form, pages 2 and 3.

Birds-eye view of pumps, compressors, and valves

Comprehensive 6-page catalog gives a brief overview of company's line of compressors, vacuum and centrifugal pumps, and valves for general power plant and industrial applications.

Printed in 3 colors, bulletin contains pictures of each piece of equipment together with a brief description, capacities, and sizes.

Bul 546 is available from Pennsylvania Pump and Compressor Co., Dept. CP, Easton, Pa. When inquiring specify CP 6051 on handy form, pages 2 and 3.

Desk-top microscope has 30,000 power

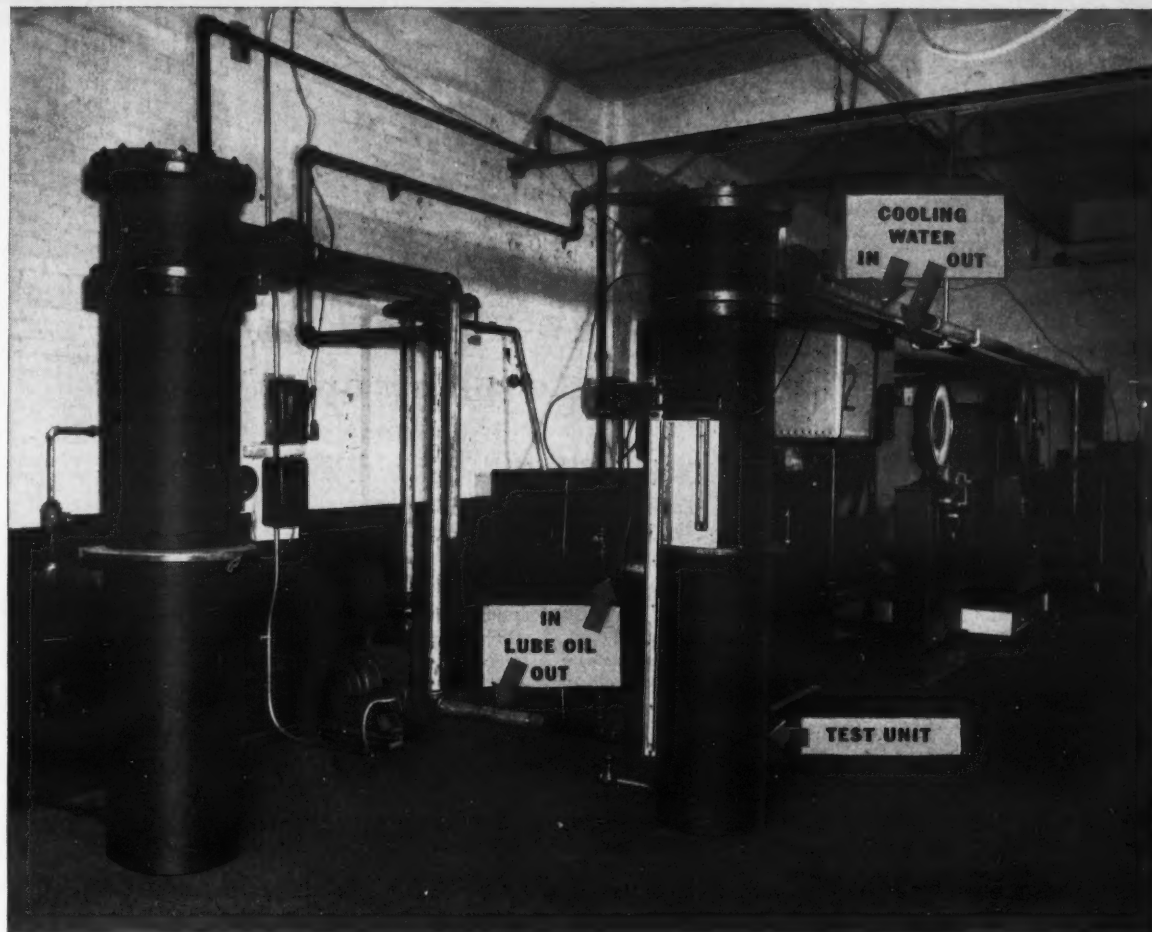
Well-illustrated, 12-page booklet describes features and operations of desk-top electron microscope. By using photographic enlargement, magnification to 30,000 powers are obtained. Booklet contains photomicrographs made with the instrument.

Form 2J6851RE is issued by Engineering Products Dept., RCA Victor Division, Radio Corp. of America, Dept. CP, Camden 2, N. J. When inquiring specify CP 6052 on handy form, pages 2 and 3.

Release motor starters bulletin

Features of type-H starters built to control squirrel-cage, synchronous, wound rotor, and multiple speed motors in ratings from 2200 to 5000 v are described in 12-page bulletin. Starters are available with air or oil contactors. Construction and operation of contactors is shown. Protection features of starters are outlined and schematic wiring diagrams illustrate typical methods of control.

Bul 14B6410B is available from Allis-Chalmers Mfg. Co., Dept. CP, 1151 S. 70th St., Milwaukee, Wis. When inquiring specify CP 6053 on handy form, pages 2 and 3.



PERFORMANCE-TESTING

ADSCO LUBE OIL COOLERS

Here's a picture with a big story! It shows performance tests being run on one of a large group of ADSCO Lube Oil Coolers.

These tests prove conclusively that everything claimed for these coolers will be performed by them when installed...because the tests are conducted under actual operating conditions in ADSCO's testing laboratories. And here's how the tests are run: Before the lube oil enters cooler at 130 g.p.m., it is brought up to specified temperature of 150F by unit at left and then cooled to 130F by 250 g.p.m. of water entering

cooler at 115F and leaving at 119F. Inlet and outlet temperatures are checked by thermometers. Pressure drops for both shell side and tube side are determined by manometers. Oil and water are collected in reservoirs and weighed in tanks on scales to determine capacities.

This testing service puts a pedigree on ADSCO Heat Exchangers. These units, engineered and tailor-made to requirements, come to you exactly rated when tested by ADSCO. The exchanger can be put in the line with complete assurance it will do the job.



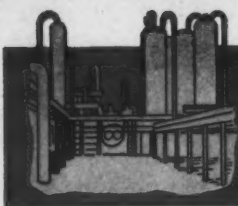
Expansion Joints • Separators • Meters • Steam Traps • Heat Exchangers • Strainers

AMERICAN DISTRICT STEAM COMPANY, INC.

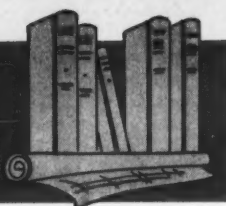
NORTH TONAWANDA, NEW YORK

Since 1877

When inquiring check CP 6054 on handy form, pgs. 2-3



Processing and Engineering Data



66

PRELIMINARY ESTIMATION Of Equivalent Length of Fittings

By CHARLES H. BLOUCH

Chemical Engineer, Day & Zimmermann, Inc.

Although there are many accurate methods for determining equivalent lengths of fittings, nearly all these require tabulation of fittings employed as starting data. In many cases it is desired to estimate pumping power requirements, pressure drop, or to size control valves for a proposed piping system. In cases like these, the exact number and type of fittings may not be known. This set of curves produces "average" results for piping systems involving fittings. These results may be used in preliminary estimates.

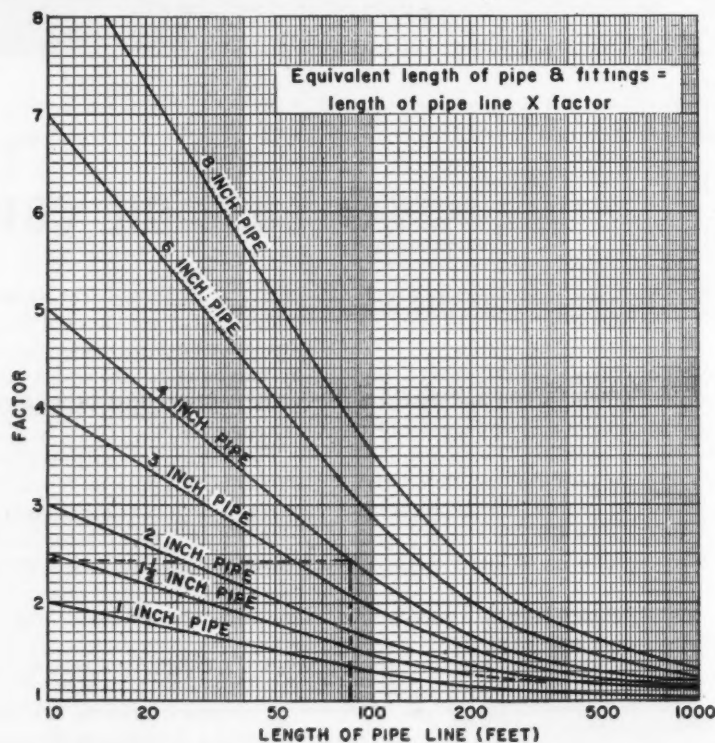
Curves give a factor based on pipe size and length

of line (both vertical and horizontal). Factor multiplied by length of line gives an equivalent length for a line with an average number of fittings.

Typical Example

A four-inch main is to be run to a new building. If length of line is 85 feet, what will the equivalent length (including fittings) be?

As shown in illustration, factor for 85 feet of 4-inch pipe is about 2.4. Equivalent length, therefore, is 2.4×85 or about 204 feet.



Chemical Processing, January 1954

Both these SPECIALISTS help you operate efficiently, reduce wasteful spending

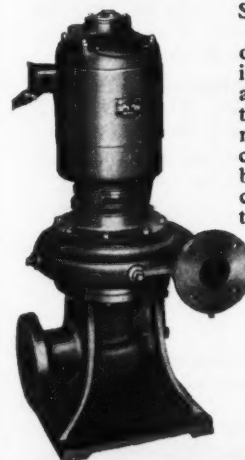
No business would attempt to operate very long without the services of an accounting specialist.

And, no liquid handling program should be started without the guidance and recommendations of a WEINMAN Centrifugal Pump Specialist.

This man knows how to reduce your pumping costs by improving pumping efficiency and capacity. He can specify the right pumps for your needs with confidence, because that is his business — because his career and his success depend upon his ability to do so.

So, if you're considering the installation of new pumps, or the improvement of your present liquid handling system, call in a specialist . . . a WEINMAN Centrifugal Pump Specialist.

Representatives in principal cities.



WEINMAN Pump Mfg. Co.

When inquiring check CP 6055 on handy form, pgs. 23

CHEMICAL PROCESSING JANUARY

NATIONAL SECURITY

(Continued from page 5)

Flame warfare is nothing new. Even the caveman knew that dumping hot coals on the head of his neighbor was an effective way to keep him from walking off with his wife. But it has only been in the last ten years that it has reached the stature of being a basic weapon owing to the development of napalm.

The Chemical Corps, working with a number of companies in the chemical industry, started experimenting with the use of chemicals as a gasoline thickener. After several unsuccessful attempts, the industrial chemists who were working with the Corps, compounded the correct mixture of coconut fatty acids, oleic acid, and naphthenic acid. The result, napalm — the "nap" for naphthenic acid and "palm" for the coconut fatty acids — which could turn gasoline into a thin or thick jelly. This gives us the effective weapon we have now.

Today industry is continuing to answer the problems of defense with dispatch and through coordinated effort. Proverbially "the squeaky axle gets the grease," but because there have been few chemical bottlenecks, and critical chemical shortages have been overcome to a large extent, we hear little about either the troubles or the triumphs of our chemical industry's national defense effort. In the past 35 years, our chemists and industrialists have won chemical independence for the nation. They have moved the world's "chemical center" from Germany to the United States. They won it independently, without bureaucratic guidance, military control, and for the most part without Federal subsidy. And they won it so completely that the infinitely greater chemical demands of the last 12 critical years have been met quietly and efficiently.

When I reflect on the vast American production of chemicals — never before equaled in history — and its relationship to our national security, I draw justifiable comfort from the fact that the chemist views the present products of his industry solely as "building blocks," — "building blocks" for better items for the future. The entire industry looks forward to the future and not backwards to the past. And this dream is constantly being given substance through the vast scientific effort represented by this industry's research program. The inexorable march of the chemical industry toward new scientific horizons is of immeasurable importance to our security, as we strive for the peace we pray may descend and remain upon this earth of ours.

Tells how oxygen content can be recorded

Four-page, two-color bulletin describes oxygen analyzing and recording instrument based on paramagnetism of the gas. Detailed specifications are included. Bul 108 is issued by Arnold O. Beckman, Dept. CP, 1020 Mission St., S. Pasadena, Calif. Specify CP 6056, pgs. 2, 3.



Like nature's porous sponge, Celite has extremely high absorptive capacity. It absorbs 220% of its own weight of water (Gardner-Coleman method)

High absorption

Celite diatomite powders absorb twice their own weight of liquid

Here is a material in powder form, so porous that 93% of its volume consists of tiny interconnected pores. This unique structure gives Celite* an exceptionally high absorptive capacity which is now being put to profitable use in a wide variety of industries. For example, Celite serves as a dry carrier for insecticide poisons . . . helps control viscosity in adhesives . . . and makes a highly effective anti-caking agent in fertilizers.

The unique structure of the microscopic Celite particles offers many other advantages. These particles are spiny and irregularly shaped, strong and rigid . . . as a result they do not pack together.

Thus Celite powders have great bulk per unit weight . . . making them valuable for fluffing up dry powders such as household cleansers . . . and extending pigments in paint and paper.

Celite's physical structure itself is also utilized in many different ways . . . as the outstanding flatting agent for paints . . . as a mild non-scratching abrasive for fine polishes . . . and to improve surface appearance in plastics. And it is also the reason why Celite can add strength, toughness, stiffness, durability and many other desirable characteristics to your product.

If you want improved product per-

formance or lower production costs, investigate industry's most versatile mineral filler. One of the J-M Celite Engineers will gladly discuss your problem. These men are backed by complete technical services and the Johns-Manville Research Center, largest laboratory of its kind in the world.

For further information write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay St., Toronto 1, Ont.



*Celite is Johns-Manville's registered Trade Mark for its diatomaceous silica products.



Johns-Manville CELITE INDUSTRY'S MOST VERSATILE MINERAL FILLER

When inquiring check CP 6057 on handy form, pgs. 2-3



Specific Gravity of AQUEOUS n-PROPYL ALCOHOL

By D. S. DAVIS

Professor of Chemical Engineering
Virginia Polytechnic Institute

Knowing concentration and temperature of aqueous n-propyl alcohol, it is possible to estimate specific gravity with this nomograph with fair accuracy. Data¹ show that specific gravity-concentration isotherms are somewhat abnormal — especially below 30%. Consequently, nomograph employs a partially non-uniform concentration scale and three temperature scales.

Typical Example

What is the specific gravity, relative to water at 60°F of 26% n-propyl alcohol at 15°C? Connect concentration of 26% with 15°C on the temperature scale

for percentages below 30% and read the intersection on the specific gravity scale as 0.960.

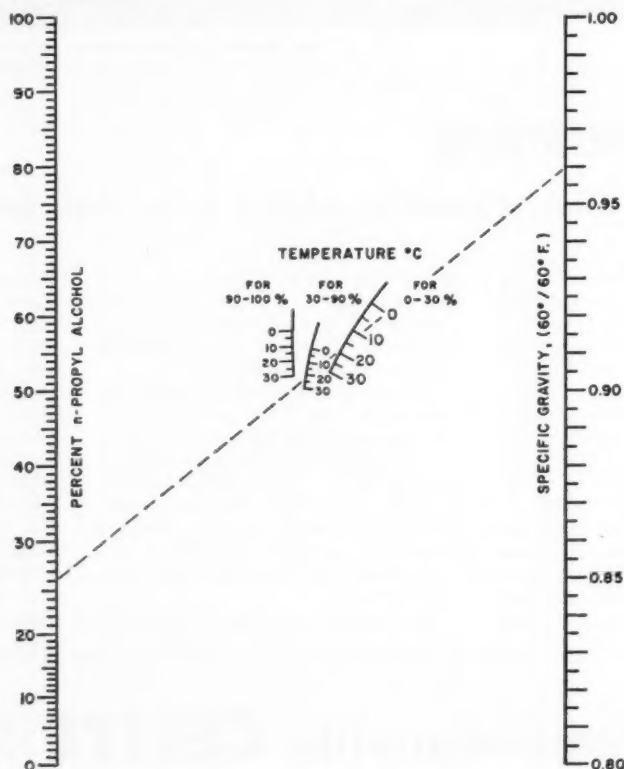
Other consistent values are:

Concentration, %	64	98
Temperature, °C	20	10
Specific Gravity	0.880	0.815

Nomograph can be used to determine concentration when specific gravity and temperature are known if proper care is used in selecting temperature scale.

LITERATURE CITED

(1) PERRY, J. H., "Chemical Engineers' Handbook," 3rd Ed, p 190, McGraw-Hill Book Co., New York, (1950)



Chemical Processing, January 1954

MORE POWER cleans fouled tubes faster



WILSON MODEL TP-301 TUBE CLEANER offers all these features

- More powerful
- Lighter weight — only 15 lb
- Shorter — only 13" overall
- Increased capacity — from ¾" up to 2½" or even 3" OD tubes
- Will operate on air pressure as low as 50 lb
- Costs less than previous models

Here is the fastest, most economical tube cleaner on the market for refinery and process heat exchangers. The Wilson Model TP-301 is the only tube cleaner which can immediately remove deposits from completely plugged heat exchanger tubes. No matter how badly tubes are fouled, the Model TP-301 puts equipment back "on stream" with a minimum of manpower and a few hours work. • Use this high speed tube cleaner to step up profits, increase output and minimize downtime. • Write for Bulletin TW-1046

VARIOUS CARBIDE BITS AVAILABLE (Special Bits for Smaller Sizes)

- TYPE M BIT** An Inserted two lip Helix type for general use 21/64" to 1 17/32" OD.
- SPE-DUR BIT** A straight flute type negative rake angle. A good three lip "chipper" for very hard deposits. 11/32" to 1 3/16" OD.
- TYPE K BIT** A two lip Helix type with adaptor for general use. 1¼" to 2¾" OD.

Representatives in all principal cities

THOMAS C. WILSON, INC.

21-11 44th AVENUE, LONG ISLAND CITY 1, N. Y.

Cable address: "Tubeclean", New York

WILSON
TUBE CLEANERS · TUBE EXPANDERS

When inquiring check CP 6058 on handy form, pgs. 25

CHEMICAL PROCESSING

JANUARY

**Determining gross heat output —
how it's done**

Complete and easy-to-use data for accurately determining the output of all type boilers, tanks, and heaters is contained in 24-page booklet. Formulas and tables cover recommended relief valves for cast-iron and steel boilers as well as those for which there is no set procedure of establishing output. Hot water supply heaters and tanks, heat exchangers and unfired pressure vessels are also covered.

Booklet "Selection and Sizing Pressure Relief Valves to Comply with ASME Boiler Code Requirements" is available from McDonnell & Miller, Inc., Dept. CP, 3500 N. Spaulding Ave., Chicago 18, Ill. When inquiring specify CP 6059 on handy form, pages 2 and 3.

Metering flow of corrosives

Printed in two colors, 14-page catalog pictures and describes porcelain, glass and metal Flow-rators for corrosive service. Instruments all employ variable-area principle.

Catalog also describes accessories such as porcelain meters, control valves, armoured accessories and hard lead, etc. Capacities and dimensions for several types are listed.

Cat 32 is issued by Fischer & Porter Co., Dept. CP, 830 Jacksonville Rd., Hatboro, Pa. When inquiring specify CP 6060 on handy form, pages 2 and 3.

**Role of ion-exchange resin
in water softening**

Profusely illustrated 21-page bulletin explains role of polystyrene cation exchange resin in water softening. Chemical characteristics of the ion-exchange resin are described along with variety of subjects dealing with water softening problems.

Leaflet No. 24 is issued by Chemical Process Co., Dept. CP, Redwood City, Calif. When inquiring specify CP 6061 on handy form, pages 2 & 3.

**Demonstrates quick method
of pipe leak repair**

How pipe line leaks of any kind can be permanently repaired in a few seconds is covered in pocket-size folder. Method of installation for both single and double repair clamp is illustrated.

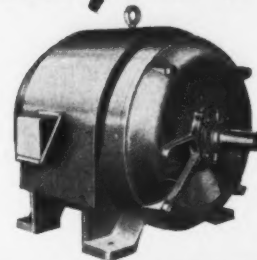
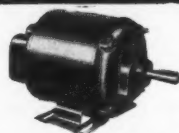
Bul 201 is available from Dept. M-12, Morris Coupling and Clamp Co., Dept. CP, Ellwood City, Pa. When inquiring specify CP 6062 on handy form, pages 2 and 3.

Wagner
ELECTRIC MOTORS
...the choice of leaders
in industry

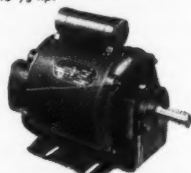
Wagner Quality Motors for your product or your plant

Whatever your motor requirements may be—single-phase or polyphase, 1/125 hp or 400 hp—Wagner can offer a standard motor that is entirely dependable in its specific application. The wide variety of motors shown here is typical of the many motors and motor modifications in the complete Wagner line.

At right is TYPE RP—open type polyphase squirrel-cage motor. It is drip-proof and suitable for all general purpose applications. 1/6 to 400 hp.

**SINGLE-PHASE**

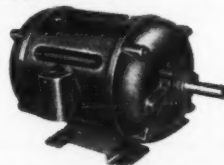
TYPE RB—Split-phase Induction. For easy starting applications with high starting current. 1/20 to 1/2 hp.



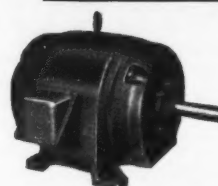
TYPE RK—Capacitor-Start Induction. For general purpose applications requiring high starting torque—normal starting current. 1/6 to 5 hp.



TYPE RC—Repulsion-Induction. For high starting torque applications involving a very long starting period. 1 to 5 hp.



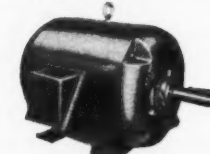
TYPE RA—Repulsion-Start Induction. For general purpose applications with high starting torque—low starting current. 1/2 to 15 hp.

POLYPHASE MOTORS

TYPE XP—Splashproof. Protected against splashing or dripping liquids. 3/4 to 200 hp.



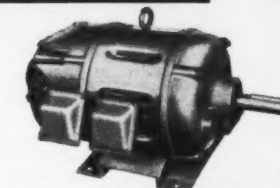
TYPE TP—Totally-enclosed, non-ventilated. Fully protected. 1/4 to 15 hp.



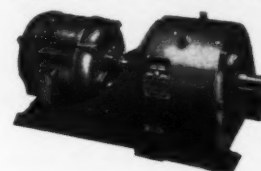
TYPE CP—Totally-Enclosed Fan-Cooled. Protected against dirt, chips, abrasives or fumes. Steel frame. 1 to 250 hp. Also in explosion proof type HP.



TYPE EP—Corrosion-resistant Totally-Enclosed Fan-Cooled. Cast iron frame. 2 to 250 hp. Also available in explosion proof type IP.



TYPE RS-1—Wound Rotor. Constant or adjustable varying speed. 1 to 250 hp. TYPE RS-2 for intermittent service. 2 to 200 hp.



GEAR MOTORS—Single-phase or Polyphase. Open or enclosed types. 1/20 to 50 hp.

* * *

In addition to a complete line of motors, Wagner also furnishes Increment Type Motor and Starter Combinations, Jet Pump Motors and a complete line of Transformers: Dry-type, Distribution and Power. Wagner engineers welcome an opportunity to serve you. Consult the nearest of our 32 Branch offices, or write direct.



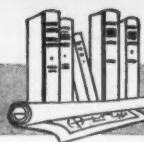
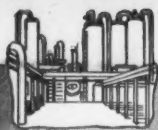
WAGNER ELECTRIC CORPORATION
6359 Plymouth Ave., St. Louis 14, Mo., U.S.A.

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS — AIR AND HYDRAULIC

BRANCHES IN 32 PRINCIPAL CITIES

M53-14

When inquiring check CP 6063 on handy form, pgs. 2-3



Estimating Delivery Of Controlled Volume Pumps

Data furnished by MILTON ROY COMPANY

Nomograph prepared by CHEMICAL PROCESSING staff

Since controlled volume plunger pumps are used in a variety of chemical applications, a guidebook has been prepared detailing capacities, materials of construction, system design ideas, and other engineering data. Current pump designs handle as much as 45 gal/min, as little as 3 cc/hr.

In order to provide a rough gage of pump size and speed for given applications, capacity data has been prepared in nomograph form. It relates plunger diameter, stroke length, speed (strokes per minute), and delivery. It is based on a simplex pump, of course, and duplex or multiple pumps extend the given capacities.

Typical Example

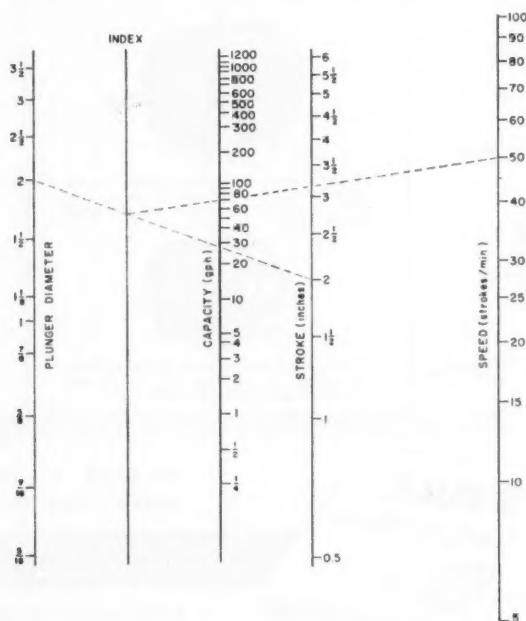
Suppose a pump with a 2" diam plunger is to be used to deliver 70 gallons per hour. If it is equipped

for a speed of 50 strokes per minute, what stroke length setting should be made?

Connect speed of 50 with capacity of 70, extending straightedge to intersect index line. Now connect 2" plunger diameter with the index point and read the stroke length as 2".

About 170 common chemical materials are covered in the pump guidebook from which data for this nomograph was taken. This material of construction section shows suitability of 11 construction materials to these chemicals.

Thirty-six-page Bul 553 is issued by Milton Roy Co., Dept. CP, 1300 E. Mermaid Lane, Philadelphia 18, Pa. . . . or check CP 6064 on handy form, pages 2 and 3.



Typical Van-Cor
pipes and fittings
fabricated to speci-
fications by Van Dorn



Van-Cor

INDUSTRIAL PLASTICS—

✓Both Chemically Resistant and
Impact Resistant Types

✓Tensile Strength of Aluminum,
with one-half its weight

✓Readily Formed, Machined,
Drawn Molded or Welded

AVAILABLE FORMS

SHEETS . . . 1/2" through 1"

PIPE . . . 1/2" through 6" diameter (10ft. lengths)

ROUND BARS . 1/4" through 2" diameter (10ft. lengths)

WELDING ROD . 1/8" and 3/16" diameter

TYPICAL APPLICATIONS

Van Dorn fabricates its Van-Cor rigid non-plasticized polyvinyl chloride into such products as: Ducts, Hoods, Chemical Tanks, Tank Liners, Plating Racks, Fume Stacks and Piping.

WRITE FOR ILLUSTRATED BULLETIN
AND SPECIFICATIONS

INDUSTRIAL DIVISION OF
COLONIAL PLASTICS MFG. CO.

SUBSIDIARY OF
THE VAN DORN IRON WORKS CO.
2685 East 79th Street • Cleveland 4, Ohio

When inquiring check CP 6065 on handy form, pgs. 2-3

Book treats all aspects of pipe and tube bending

Hot and cold bending of ferrous and non-ferrous pipe and tubing of all sizes is subject of book. Outstanding types of equipment and their uses are explained. Food and chemical process piping, and private and commercial radiant heating installations are covered. Material on layouts, mandrels, wooden dies, classifications and limitations of each type of bending together with numerous halftone and line diagrams make this a practical working manual for shop and field men. 189 pages, 15 tables.

Book is available by remitting \$5.00 direct to The Industrial Press, 148 Lafayette St., New York 13, N. Y. When inquiring specify CP 6066 on handy form, pages 2 and 3.

Graphically describes miniature indicator

Well-illustrated three-color bulletin makes extensive use of photographs in displaying a miniature indicator. Several complete units and all components are pictured and described. Twelve-page "Publication 10831" is issued by Fischer & Porter Co., Dept. CP, 11A Jacksonville Rd., Hatboro, Pa. When inquiring specify CP 6067 on handy form, pages 2 and 3.

Backward and forward looking glances directed at plastics

A review of the present state and a look into the future was the objective of recent symposium on Plastics Testing. Copies of the papers presented at 54th Annual Meeting of American Society for Testing Materials are reproduced in 76-page heavy-cover book.

Bul 132 can be obtained by remitting \$2.00 direct to American Society for Testing Materials, Dept. CP, 1916 Race St., Philadelphia 3, Pa.

Illustrates stainless steel and Monel utensils

Complete line of company's stainless steel and Monel utensils, including pails, dippers, funnels, scoops, measures, starch buckets, batch cans, beakers, and shovels, is illustrated and described in 4-page catalog. Information on special items and fabricating services is also included.

Cat on stainless steel and Monel Utensils is available from Metalsmiths, Div. of Orange Roller Bearing Co., Inc., Dept. CP, 560 White St., Orange, N. J. When inquiring specify CP 6068 on handy form, pages 2 and 3.



...with a GAULIN HOMOGENIZER

There are many machines on the market today that do a good job of breaking-up solid agglomerates in a dispersion. There are many more that do a good job of simply dispersing the particles.

But only one — a Gaulin Homogenizer does both jobs at once, and provides a *uniformly finer* dispersion.

A Gaulin reduces agglomerates to their ultimate particle size, disperses them evenly to provide a more uniform, stable dispersion.

And does it Faster, at Lower Cost than any other machine.

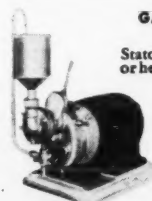
These are just a few of the reasons why the Advance Coatings Company in Westminster, Mass. uses a 200 GPH Gaulin, as shown above, in manufacturing their adhesives and other emulsions.

For more information, write for descriptive bulletin, today.



**GAULIN PILOT PLANT
HOMOGENIZER**

Ideal for experimental purposes, operation or process requiring up to 25 gallons per hour capacity. Handles quantities as small as one pint. Available on low rental basis.



**GAULIN TWO-STAGE
COLLOID MILL**

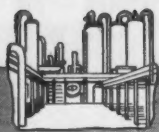
Stator is jacketed for cooling or heating. Gap setting adjustable for .001" to .045". Only 45 seconds clean-up required in changing colors. 12" head room. 12" x 17" floor area.

Manton-Gaulin
MANUFACTURING COMPANY, INC.

55 GARDEN STREET, EVERETT 49, MASS.

World's largest manufacturer of Homogenizers,
Triplex Stainless-Steel High Pressure Pumps,
and Colloid Mills

When inquiring check CP 6069 on handy form, pgs. 2-3



MOLECULAR WEIGHTS OF HYDROCARBONS From Refractive Indices and Boiling Points

By GEORGE E. MAPSTONE

Edited by D. S. DAVIS

Professor of Chemical Engineering
Virginia Polytechnic Institute

This nomograph is a form of a previous correlation¹ of hydrocarbon molecular weights with refractive indices and boiling points. It is based on the equation:

$$\log M = 0.001098T_b + 1.9043 + \log(2.1500 - n_D^{20})$$

where —

M = molecular weight —
T_b = boiling point (760 mm Hg) °F —
n_D²⁰ = refractive index —

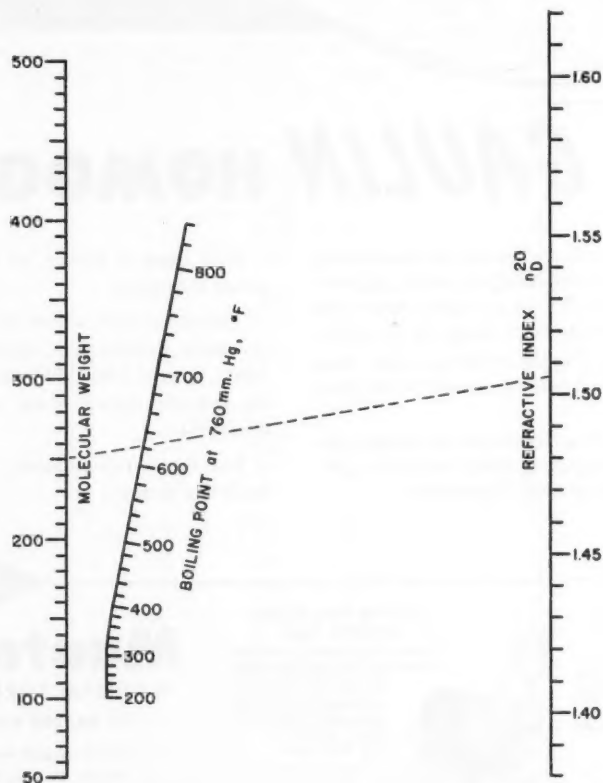
Typical Example

Petroleum fraction boiling at 620°F has a refractive index of 1.5050. What is the average molecular weight?

As shown, connect 1.5050 with 620. Molecular weight is 250.

LITERATURE CITED

(1) HERSH, FENSKE, BOOSER AND KOCH, *J Inst Petrol*, vol 36, p 624-668, (1950)



Edward PRESENTS

New ALL-PURPOSE STEEL VALVES

A new all-purpose valve series, ideal for almost any service where small O. S. & Y. steel valves are used. Drop forged steel for greatest strength... simplest packing arrangement... tight, easily accessible union or bolted bonnet joints... bronze yoke bushings... microscopically mated seats and disks... lock welded parts. Built in sizes 1/4 to 2 in. inclusive, globe or angle, screwed or socket welding ends, carbon or chromium molybdenum steels, in 600 or 1500 lb classes. Stocks now available. Bolted bonnet 1-1/4 in. up 600 lb, 1 in. up 1500 lb. Union bonnet in smaller sizes.

For full details, dimensions, illustrations write today for your free copy of . . . **BULLETIN 501**

Another Product

Edward Valves, Inc.

Subsidiary of ROCKWELL MANUFACTURING COMPANY
1230 West 144th Street, EAST CHICAGO, INDIANA

When inquiring check CP 6070 on handy form, pgs. 2-3

NoDrip

...STOPS CONDENSATION DRIP!

NoDRIP PREVENTS RUST
in addition to stopping drip and keeping floors dry. **ANYONE CAN APPLY** Brush, trowel or spray NoDrip on tanks, condensers, suction lines, vats, pipes, walls, ceilings, etc. NoDrip adheres to metal, concrete, brick, plaster. It forms a seamless covering that is effective as soon as dry. Acid, alkali and brine resistant.

Interesting 32-page Handbook shows what NoDrip is and what it does. It's free. Send coupon today.

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J. W. MORTELL CO., 530 BURCH ST., KANKAKEE, ILLINOIS
TECHNICAL COATINGS SINCE 1895

When inquiring check CP 6071 on handy form, pgs. 2-3

NEW LITERATURE

Film documents brass mill products

Manufacture of brass sheet, rod, wire and tube is portrayed in 16 mm sound motion picture in color.

Film is 29 min long and depicts production of brass, in terms understandable to the layman, from its beginning in the casting shop to its final distribution to industry. Extensive use of animation explains details of casting, extrusion, drawing, and rolling processes.

"The Science of Making Brass" is available, to brass users, from Chase Brass & Copper Co., subsidiary of Kennecott Copper Co., Dept. CP, 236 Grand St., Waterbury 20, Conn. When inquiring specify CP 6072 on handy form, pages 2 and 3.

Offer bulletin on steam turbines

High speed steam turbines for centrifugal compressor and blower drives are subject of 18-page bulletin. Drawings, photos, and cutaways supplement text. Specifications are included.

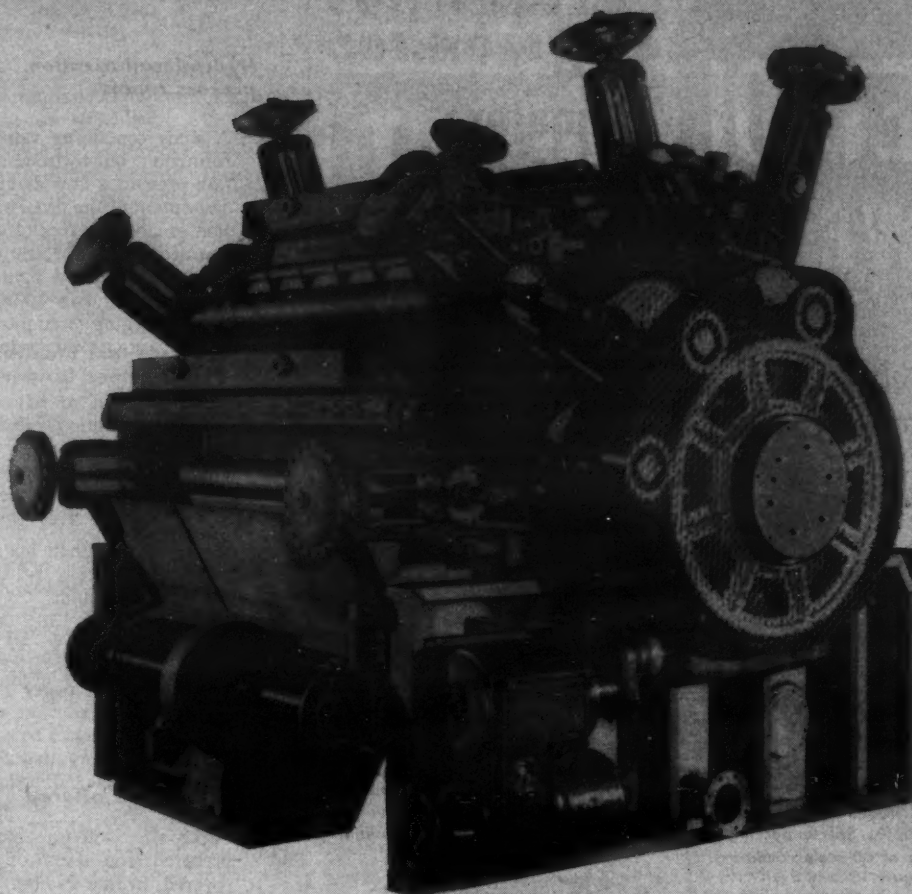
Bul 1966-536-BP is issued by Worthington Corp., Dept. CP, Harrison, N. J. When inquiring specify CP 6073 on handy form, pages 2 and 3.

Lists special purpose textile starches

Leaflet outlines types, uses and principal characteristics of textile starches. It describes 26 special purpose starches for warp sizing, finishing, and printing.

Leaflet "Starches with Amazing Versatility" is issued by National Starch Products Inc., Dept. CP, 270 Madison Ave., New York 16, N. Y. When inquiring specify CP 6074 on handy form, pages 2 and 3.

For more information on product at right, specify CP 6075 ... see information request blank between pages 2 - 3.



YES! THIS TOO IS A CONTINUOUS VACUUM FILTER FOR USE IN THE PRODUCTION OF SODA ASH

PROBLEM: To dewater to as low as possible moisture content a sodium bicarbonate filter cake and to wash the cake free of ammonium chloride.

EIMCO'S ANSWER: The unit shown above — The Eimco Sodium Bicarb Filter featuring:

1. Special heavy-duty construction throughout.
2. Special back-wash feature to prevent blinding of filter media.
3. Special wash system to provide uniform wash water distribution.
4. Special streamlined drainage construction with extra large valve to insure maximum removal of wash liquor and low cake moisture.

5. Special heavy-duty press rolls, to provide additional cake compression in the removal of moisture from cake.

This filter is used in the production of soda ash by the Solvay Process, and in order to have a better than average product the filter is equipped to remove a greater percentage of impurities through proper washing and moisture reduction than ever possible before.

This unit is typical of the specialized fields for which Eimco equipment is designed and built. When you have a problem in filtration we offer the services of men who know the filtration business, plus laboratory and research service and the experience of the Eimco Corporation, serving process industries for more than a half a century.



THE EIMCO CORPORATION

Salt Lake City, Utah, U.S.A.
Export Office: Eimco Bldg., 52 South St., New York City

You Can't Beat An Eimco

AIRETOOL SOLVES

**2
major
tube
maintenance
problems**



Geared air driven
condenser cleaner



Spiral brush

Reamer

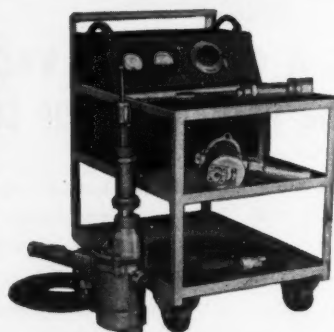
Straight flute drill

CLEANING

Here's the cleaner for heavily scaled small diameter tubes in heat exchangers, condensers. A powerful low speed motor enables the operator to clean without tube injury. A flushing agent is introduced through the motor and drive shaft to keep the drill cool under all scale conditions. Special packing glands prevent leakage. Designed for thorough, safe cleaning of all scale conditions.

EXPANDING

It's new! Rolls tight tube joints automatically by the Retractive Method! Control is set to desired expansion, expander is fully inserted and rolls a short section of the tube. When full expansion is reached, the Expander then automatically retracts, expanding the entire thickness of the tube sheet. This method draws metal toward mouth of tube, prevents elongation, distortion or enlargement of holes, reduces time needed to roll tight joints.



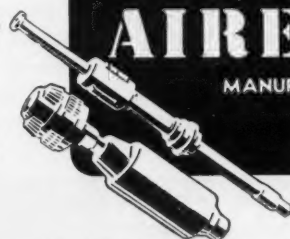
Airetool Automatic Retractive Tube Expansion Control System — for installing tubes in heat exchangers, condensers, boilers.

Write for details about tube cleaning, tube expanding.

BRANCH OFFICES:

New York • Chicago • Philadelphia
Tulsa • Houston • Baton Rouge
Hudson Heights (NJ)

Representatives in principal cities of
U. S. A., Canada, Mexico, South
America, England.



AIRETOOL
MANUFACTURING COMPANY

SPRINGFIELD, OHIO

THERE'S AN AIRETOOL TUBE EXPANDER OR TUBE CLEANER FOR EVERY TYPE OF TUBULAR CONSTRUCTION.

When inquiring check CP 6076 on handy form, pgs. 2-3

NEW LITERATURE

Hydrodesulfurization process report

A study containing valuable information on hydrodesulfurization presents a flow diagram and description of the process; discussion of possible applications; investment and operating costs; utility consumption figures; and economics for two 10,000 B/D units charging straightrun gas oil and cat-cracked cycle oil respectively.

Report is said to have special value at this time because of the potentials inherent in an upgrading process that is more economical, and can be applied to a wider range of feed stocks.

Report on the Shell hydrodesulfurization process is available from The Lummus Co., Dept. CP, Room 359, 385 Madison Ave., New York 17, N.Y. When inquiring specify CP 6077 on handy form, pages 2 and 3.

Hose selector offered

Pocket-size selector has been prepared for users of rubber covered hydraulic hose. Starting with any known factor, such as ID, OD, minimum burst, working pressure required, or bend radius, selector indicates proper hose to employ.

Selector is available on letterhead request to Republic Rubber Div., Lee Rubber & Tire Corp., Dept. CP, Youngstown 1, Ohio.

High temperature corrosion reprint available

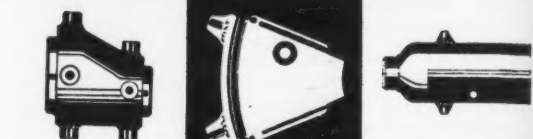
Paper, "Corrosion by Aqueous Solutions at Elevated Temperatures and Pressures," delivered at the 1953 conference of the National Association of Corrosion Engineers, has been made available in reprint form. Technical paper was written by Dr. F. H. Beck and Dr. M. G. Fontana, of Ohio State University.

Results of investigations of effect of corrosives on alloys of the 18-8 variety, as well as high nickel grades are presented. Results suggesting possibility of

FOR

WISCOUS
FLUIDS...

WELDING-JACKETED FITTINGS



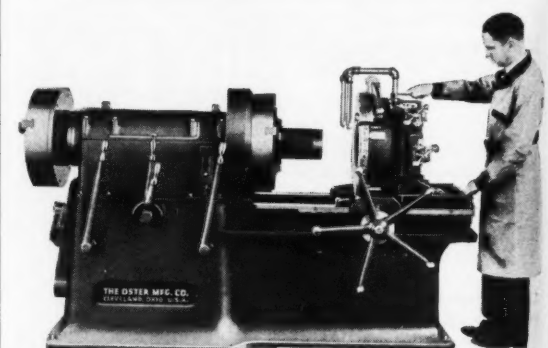
SCREWED & FLANGED FITTINGS & PIPE

Catalogue
on request

Red Jacket Company, Inc.

MANUFACTURERS OF JACKETED FITTINGS AND JACKETED PIPE
INVESTMENT BUILDING PITTSBURGH 22, PENNSYLVANIA

When inquiring check CP 6078 on handy form, pgs. 2-3



The **OSTER** "RAPIDUCTION" FAST AND ACCURATE

The Oster No. 6A "Rapiduction" is designed for large-scale production threading. Its many spindle speeds allow every size of pipe to be threaded at maximum speed. Throughout its entire standard pipe range of 1" to 6" and bolt range of 1" to 4" die-head change is never necessary. From machine bed to die-head the "Rapiduction" is quality built.

For the full story on the complete line of Oster threading machines see your local Oster Distributor.

THE OSTER MANUFACTURING CO.
Main Office and Factory:
2032 East 61st St. • Cleveland 3, Ohio
Builders of Cost Reducing Threading Equipment since 1893

When inquiring check CP 6079 on handy form, pgs. 2-3

CHEMICAL PROCESSING

LEFAX POCKET SIZE TECHNICAL DATA BOOKS \$1.25 EACH

Printed on loose leaf, 6 hole, 6 3/4" x 3 3/4" bond paper, each book contains about 140 pages of technical data, presenting condensed, accurate and essential data for the student, engineer, technical worker and business man.

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LEFAX Dept. CHP 6 Philadelphia 7, Pa.

When inquiring check CP 6080 on handy form, pgs. 2-3

Cost Less
because they
Last Longer

"Metalsmiths"
Stainless Steel
and Monel
Utensils

METALSMITHS Utensils are built to the exacting needs of corrosion-resistant service in the process industries. Efficiently designed—made of correct metal analysis and weight—fabricated by latest techniques—backed by over 30 years' specialization in corrosion-resistant equipment.

Prompt shipment
—anywhere!

WRITE FOR LATEST CATALOG — PRICE LIST

METALSMITHS

Division of Orange Roller Bearing Co., Inc.
556 White Street Orange, N. J.

When inquiring check CP 6081 on handy form, pgs. 2-3

JANUARY, 1954

NEW LITERATURE

using minute amounts of inhibiting agents to control corrosion are described.

Technical paper is available from Alloy Casting Institute, Dept. CP, Mineola, N. Y. When inquiring specify CP 6082, pages 2 and 3.

Educational film covers mechanical seals

Designed for showings to engineering and maintenance meetings, 20-minute, full-color film on mechanical shaft seals for centrifugal pumps covers subject from design to maintenance.

Various seal types and their applications are described. Seal operation is graphically illustrated by animated drawings. Condensed transcript of film in bulletin form is also available.

Arrangements for film showings can be made by contacting L. C. Kimball, Byron Jackson Co., Dept. CP, Box 2017, Terminal Annex, Los Angeles 54, Calif. Bul 153-10,000 is available at same address. When inquiring specify CP 6083 on convenient Reader Service slip between pages two and three.

Heat exchanger treated in quarterly

Distributed quarterly, magazine contains article on air-cooled heat exchangers, their types, applications, design consideration, and typical installations.

Second article describes Celanese Corporation's new petrochemical plant at Pampa, Texas, and its use of perforated-tray columns and air-cooled condensers.

Feedwater heater installations at Illinois Power Company's new 75,000 kw Hennepin station are also described.

Alco Products Review, Fall issue, available from American Locomotive Co., Dept. CP, 30 Church St., New York 8, N. Y. When inquiring specify CP 6084 on handy form, pages 2 and 3.

FOR VALVES IN CORROSIVE SERVICE

TEFLON* PACKINGS BRAIDED TYPE



STYLE 704

Chemical plants large and small have long been looking for a permanent acid packing for those "hard-to-get-at" valves.

These valve stems must be packed and made tight at all times. A drip from a leaky valve is dangerous to personnel. These acid valves require

1/8", 3/16", 1/4", 5/16" or 3/8" square packing. Up to now braided blue asbestos packing has been considered best and cheapest (60-day life). Today the whole world of packing has been changed by the material "Teflon". Braided yarn packing made of Teflon is replacing all forms of braided packing for acid service because it lasts as long as the valve itself. Practically no acid, diluted or concentrated, hot or cold, has any affect on the packing. (Many records of two-years' service or more have been reported). This is highly important to all Chemical Engineers and Chemical Plant Operators.

"JOHN CRANE" Style 704 is available in handy coil or spool form in a full range of sizes. A stock of "JOHN CRANE" Braided Teflon Packing in your storeroom may be a life saver for you.

Teflon is recommended on chemicals at any pressure with temperatures ranging from -100°F. to +500°F.


Many Chemical Engineers prefer "JOHN CRANE" Style 704 Braided Teflon Packings for their service. For the best in mechanical packings fabricated from braided Teflon, contact Crane Packing Company. Send for this Teflon Technical Bulletin. Write 1821 Cuyler Avenue, Chicago 13, Illinois.



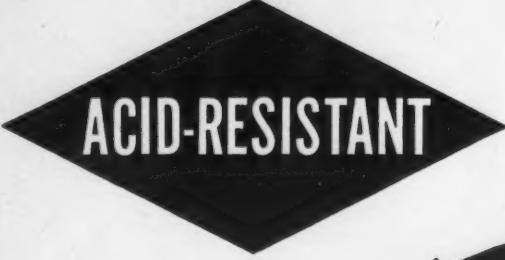
*Du Pont's trademark for tetrafluoroethylene resin.

JOHN CRANE CRANE PACKING COMPANY


When inquiring check CP 6085 on handy form, pgs. 2-3



UNARCO



ACID-RESISTANT



**GASKETS
and
SHEET
PACKING**

For extreme resistance to strong mineral acids, specify Unarco Style 96V Gaskets and Style 55V Sheet Packing.

They're made from finest quality blue asbestos, impregnated and coated with an exclusive Unarco elastomer which is virtually impervious to concentrated hydrochloric, sulphuric, and nitric acids.

Styles 96V and 55V also are excellent for use with caustics, ketones, aldehydes, and alcohols, and—like all of the many Unarco packings and gaskets—carefully developed and thoroughly proved to meet exacting, specific requirements.

Whatever your packing and gasket needs, you can look to Unarco with confidence.

Phone Your  Packing and Gasket Distributor, or Write

UNION ASBESTOS & RUBBER COMPANY
332 SOUTH MICHIGAN AVENUE • CHICAGO 4, ILLINOIS

When inquiring check CP 6086 on handy form, pgs. 2-3

NEW LITERATURE

Outlines extensive use of dispersing agents

Technical data on the application of dispersing agents to insure efficient use of finely divided solids or liquids in water is contained in 4-page bulletin.

Use of dispersing agents in preparation of cosmetics, household polishes, insecticides, paints and inks, and other products are described. The particular dispersing agents described are complex polymerized organic salts of sulfonic acids of the alkyl-aryl type.

Bul 13 is available from the R. T. Vanderbilt Co., Specialties Div., Dept. CP, 230 Park Ave., New York 17, N. Y. When inquiring specify CP 6087 on handy form, pages 2 and 3.

Purifier kills fumes

Device for removing carbon monoxide, odors, and fumes from all types of gasoline-powered equipment is explained in 4-page folder. Catalytic exhaust can replace present muffler without need for changing clearance. New applications are made possible for equipment once restricted to areas having large circulating air supply.

Folder "OCM Catalytic Exhaust" is issued by Oxy-Catalyst, Inc., Dept. CP, Wayne, Pa. When inquiring specify CP 6088 on handy form, pages 2 and 3.

Present revised edition on CaCl₂ refrigeration

Sixth edition of bulletin on calcium chloride refrigeration is said to contain many revisions and additions, including tables, graphs, and a new section giving specific data on various industrial and commercial applications of CaCl₂ refrigerating brines.

Technical & Engineering Bul 4 is available on letterhead request to Advertising Dept., Solvay Process Div., Allied Chemical & Dye Corp., Dept. CP, 61 Broadway, New York 6, N. Y.

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"Built in seal"

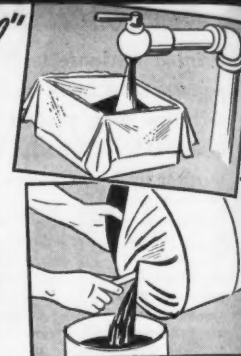
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To assure greater product protection, "Built-In Seal" Polyethylene Liners incorporate an exclusive welded seal that actually exceeds the sidewalls in strength. *The seal is warranted for the life use of the liner.*

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When inquiring check CP 6089 on handy form, pgs. 2-3

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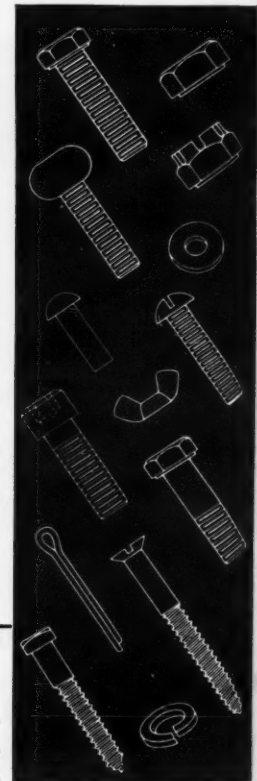


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When inquiring check CP 6090 on handy form, pgs. 2-3



Facilitates color comparisons when using pH test papers

Pocket device provides color charts which reproduce accurately the colors shown by manufacturer's Sliding panels which bear the color comparison pH test papers at 41 points on the pH scale. scales fit into a case which provides two windows for making the necessary comparisons. Also imprinted on the device are tables of conversion factors and a very useful list of the pH values of various chemicals.

Bulletin describing the Colorscope is issued by R. P. Cargille Laboratories, Inc., Dept. CP, 117 Liberty St., New York 6, N. Y. When inquiring specify CP 6091 on handy form, pages 2 and 3.

Satisfactory construction materials for chlorine dioxide processes

Materials of construction which have proved satisfactory for chlorine dioxide production and bleaching processes are described in 30-page booklet. It is issued by The Atlas Mineral Products Co., Dept. CP, Mertztown, Pa. When inquiring specify CP 6092 on handy form, pages 2 and 3.

Rubber linings control corrosion and abrasion

Booklet describes how corrosion and abrasion can be controlled through the application of rubber or synthetic linings. Maintenance coatings available in cans for application by plant personnel are also covered. Detailed information is presented on accelerators, thinners, primers, curing, and coverage.

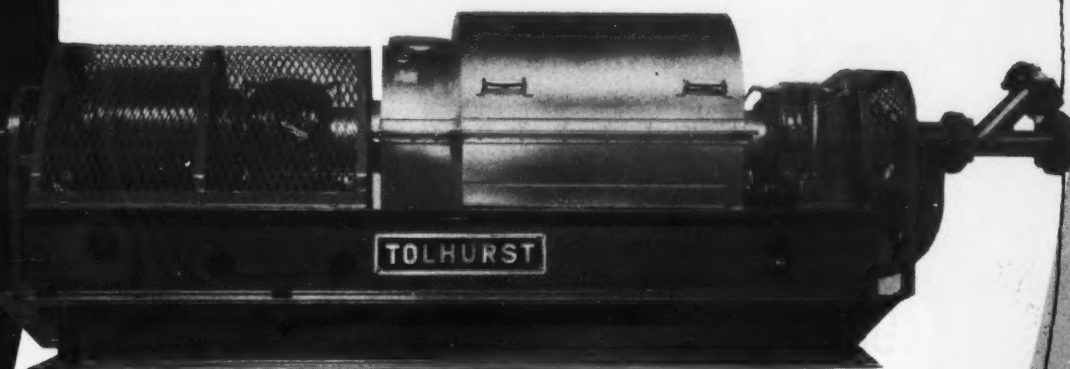
For "Corrosion and Abrasion Control Booklet" address Goodall Rubber Co., Dept. CP, 467 Whitehead Rd., Trenton 4, N. J. When inquiring specify CP 6093 on handy form, pgs. 2 & 3.

Fast, accurate response featured by DC voltage regulator

Description covering construction, operation, installation, and advantages of Rocking Contact voltage regulators for DC machines is contained in two-page leaflet. Included in literature is a chart showing approximate applications of the four available types of these units. Regulators are also suitable for many special applications, such as speed, current, and tension regulation in steel mills, paper plants, and in the plating and electrochemical industries.

Leaflet 14B6137A is available from Allis-Chalmers Mfg. Co., Dept. CP, 1151 S. 70th St., Milwaukee 1, Wis. When inquiring specify CP 6094 on handy form, pages 2 and 3.

Quick, 3-Way Adjustability Makes NEW "MAXI-FLEX" CONTINUOUS CENTRIFUGAL most FLEXIBLE in field



NOW for the first time, continuous centrifugal users can profit from these 3 quick Tolhurst adjustability features:

1 VARI-BEACH
is a hydraulic-mechanical combination drive with hand wheel control. It allows instantaneous selection of the beach speed from 0 to 300 inches per minute.

2 VARI-POOL ORIFICE PLATES
provide a choice of seven different pool depths by simple adjustment.

3 HIGH F x G
aids a difficult separation. The Tolhurst "Maxi-Flex" Continuous user has a centrifugal force field which can be varied up to almost 2,000 times gravity.

OTHER TOLHURST "MAXI-FLEX" FEATURES

Self-cleaning feed chambers allow maximum utilization of this machine's flexibility features. Full ball and roller bearings permit more compact inner bowl design. This design feature minimizes bowl deflection even when processing viscous materials at high speeds.

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If you are presently using continuous centrifugals or would like to investigate their application, ask for details about Tolhurst's offer to supply a machine for processing tests on your materials in your plant.

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American Machine and Metals, Inc., Dept. CP-154
East Moline, Illinois

Please send literature on Tolhurst "Maxi-Flex" Continuous Centrifugals.

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ADDRESS

CITY & ZONE

STATE

NAME AND TITLE

When inquiring check CP 6095 on handy form, pgs. 2-3

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TOKHEIM PUMPS
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LIQUID HANDLING!"**



For filling oil coolant reservoirs directly from drums

You'll find it pays to standardize on TOKHEIMS. These double-action hand pumps have no equal for fast, easy, safe handling of liquids. Stop wasteful, dangerous dripping and slippery floors. Reduce fire hazard and accidents common to other methods of transfer. Save on drum storage space. More useful—available with optional parts to handle a wide variety of products. UL-approved for petroleum liquids. Available in hose and spout models—for drums, skid tanks and underground installations. Call your dealer, your Tokheim representative, or write the factory for descriptive literature.

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When inquiring check CP 6096 on handy form, pgs. 2-3

NEW LITERATURE

**Points out advantages
of steel weldments**

Brochure considers advantages of steel weldments, and indicates some of the production facilities at manufacturer's plants. Most of brochure is devoted to illustrations and short descriptions of weldments made by company. Included is a technical section which presents definitions of interest concerning weldments, comparative properties and advantages of steel vs cast iron, and general data showing weldability of ferrous metals.

Bul "Weldments" (Form 52553) is issued by Struthers Wells Corp., Dept. CP, Titusville, Pa. When inquiring specify CP 6097 on handy form, pages 2 and 3.

**Gives technical data on
1,4-Naphthoquinone**

Physical and chemical properties of 1,4-Naphthoquinone are described in 4-page bulletin. Some applications are listed including use as polymerization regulator in manufacture of synthetic rubber and polyester resins, as stabilizer against deterioration of transformer oils, and as antimycotic agent. Its reactant utility in a variety of chemical syntheses is also covered.

Bul 1-4 is issued by National Aniline Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N. Y. When inquiring specify CP 6098 on handy form, pages 2 and 3.

**Gives hard facts on
water softeners**

Brochure contains information for accurate specification of water softener equipment for any manufacturing or processing plant, hospital, or other institutions where soft water is required.

Data on valves as well as detailed chart-type specifications of sizes and models of softener units are included. Individual model numbers, exchange ca-

**SMOOTH—VIBRATIONLESS
PROPELLERS**

**for MIXING, STIRRING
AERATING, PUMPING, etc.**

Manufactured by an exclusive process, MICHIGAN propellers are perfectly balanced to avoid whip and strain on shafts. And because of their superior functioning are now standard parts of the products of many leading equipment manufacturers.

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Side Entering Mixer by
EASTERN INDUSTRIES
NEW HAVEN, CONN.

MICHIGAN WHEEL CO.
GRAND RAPIDS 3, MICH.

When inquiring check CP 6099 on handy form, pgs. 2-3

**A REAGENT FEEDER
THAT DEFIES CORROSION
★ THE NEW CLARKSON
MODEL E IN RIGID PVC**

- ★ Accurate
- ★ Economical
- ★ Corrosion-Proof
- ★ Wide Feeding Range
- ★ Complete Dependability



PROVED PERFORMANCE PLUS PVC

The Clarkson Model E reagent feeder, with practically all of the mining industry market, has a long standing record of proved performance. Now fabricated entirely from rigid polyvinyl chloride, the new Model E feeder combines remarkable corrosion resistance with performance tested design, high accuracy and low cost. For all chemical industry applications, the outstanding value in reagent feeders is the Clarkson Model E in pvc.

Write today for Bulletin 541—it tells the full story.

THE CLARKSON COMPANY

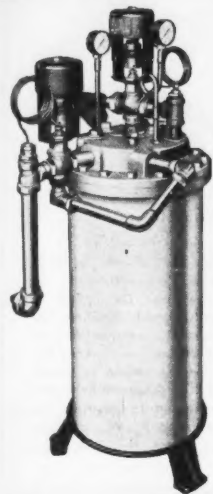
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When inquiring check CP 6100 on handy form, pgs. 2-3

CHEMICAL PROCESSING

CONDITIONS DEMANDED—

So-COE developed...



The WATER HEATER OF TOMORROW

Here is a radically different "package" water heater. • It arrives completely assembled, tested and adjusted. No accessories to buy. Simply attach pipes, then turn on water and steam. • An advanced product of high quality in every detail. • Utilize abundant water at the safe temperature of 120° F. for washroom; or water at 160° to 180° F. direct from tank simultaneously for scalding purposes. • Seventeen sizes in capacities from 200 to 3000 G.P.H.

Heavily glass-lined A. S. M. E. tanks.

MAXIMUM Thermal Efficiency.

All parts quickly and easily accessible.

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Long life through minimum corrosion. 17 Sizes.

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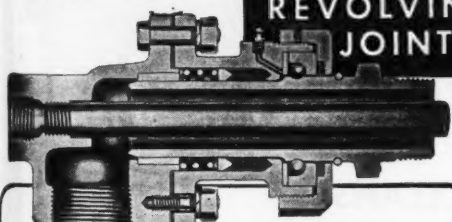
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When inquiring check CP 6101 on handy form, pgs. 2-3

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control
... less
maintenance

The Improved
BARCO
REVOLVING
JOINT



HERE is Barco's new, improved Type IBR Revolving Joint for supplying steam, water, oil, or other fluids to rolls, dryers, drums.

LOW TORQUE! Inherent low torque little affected by pressure, speed or temperature—thanks to special ball bearing used in combination with self-lubricating graphite-carbon bearing and new low torque long-life chevron packing.

LEAKPROOF AND LONG LIFE! Note wide spacing between bearings. Insures close alignment and long life for self-adjusting, self-sealing chevron packing.

EASY SERVICING! Internal parts readily accessible—usually without removing joint from roll. Sizes ½" to 2". Single flow or syphon styles. Steam: 150 p.s.i., 450°F., 500 RPM. Hydraulic: 200 p.s.i., 750 RPM.



Send for new Bulletin 300.

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5378 Hough St., Barrington, Ill (A Chicago Suburb)

When inquiring check CP 6102 on handy form, pgs. 2-3

NEW LITERATURE

capacities, flow rates, size of units and meters, shipping weights, etc., are covered.

Brochure "Illco-Way" is issued by Illinois Water Treatment Co., Dept. CP, 840 Cedar St., Rockford, Ill. When inquiring specify CP 6103 on handy form, pages 2 and 3.

Issue catalog of 60 compounds

Indexed alphabetically and by class (acetylenic alcohols, fused ring heterocycles, hydrocarbons, phenol and substituted phenols, pyridine and pyridine derivatives), 7-page catalog gives concise information on 60 commercially available compounds.

Bul "Reilly Chemical Index" is issued by Reilly Tar & Chemical Corp., Dept. CP, 1615 Merchants Bank Building, Indianapolis 4, Ind. When inquiring specify CP 6104 on handy form, pages 2 and 3.

Lists line of control valves

Condensed 12-page bulletin describes air and hydraulic control valves. Sectional views of body, plunger, packing, and interior operation are illustrated. Sizes, action, permissible pressures and temperatures are shown.

Bul 531 is issued by C. B. Hunt & Son, Inc., Dept. CP, Salem, Ohio. When inquiring specify CP 6105 on handy form, pages 2 and 3.

CaCO₃ gives paint special qualities

Precipitated calcium carbonate's role in production of paint is described in 4-page technical bulletin. Manufacturer's two types of calcium carbonate are examined and suggestions for application of each made.

Bul P-18 is issued by Witco Chemical Co., Dept. CP, 260 Madison Ave., New York 16, N. Y. When inquiring specify CP 6106 on handy form, pages 2 and 3.



INSTALLED throughout the World!

stainless steel
intermediate feed dryer
for use in reclaiming
plastic food covering.

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The World Standard for...

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From Canada to Argentina...from California to Arabia... STANDARD-HERSEY Dryers have solved drying problems of every type. Thousands of STANDARD-HERSEY Dryers have been designed and constructed for hundreds of products and installed in countries around the world. STANDARD will engineer your problem from analysis to final installation. Our pilot dryer plant has aided hundreds of manufacturers. Let us tell you about this service.



Write for 12-page bulletin
giving full information.



STANDARD STEEL CORPORATION
5083 Boyle Ave., Los Angeles 58 • 7 East 42nd St., New York 83

When inquiring check CP 6107 on handy form, pgs. 2-3

heart of the strainer

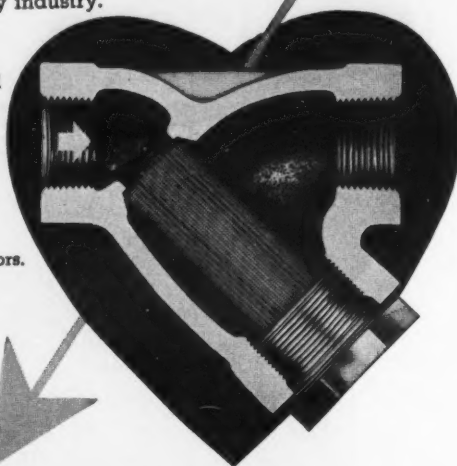
A high-grade, woven Monel wire screen is the heart of the Yarway Strainer—one reason why hundreds of thousands of these strainers are policing pipe lines in nearly every industry.

OTHER REASONS —

- cadmium plated bodies and screen caps
- straight threads, machined faces and spark-plug-type gaskets on screen caps
- ten sizes from 1/4" to 3"

Sold by 216 industrial distributors. Write for Bulletin S-203.

YARNALL-WARING CO.
125 Mermaid Ave.
Philadelphia 18, Pa.



YARWAY STRAINERS

When inquiring check CP 6108 on handy form, pgs. 2-3

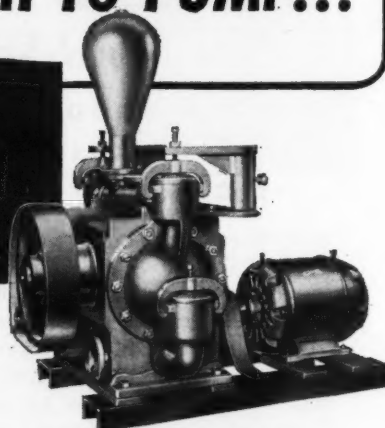
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You need a
**SHRIVER
DIAPHRAGM
PUMP**

for

- ✓ Corrosive
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- ✓ Viscous
- ✓ Thick • Heavy
- ✓ Delicate
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Bulletin 137 tells why.



POINTS TO REMEMBER

- No contact between fluid handled and mechanical parts of pump.
- No packings, hence no leakage.
- Easy to inspect and clean.
- Minimum maintenance cost.
- Parts contacting fluid made of any metal, rubber or synthetic resin lined.
- Ample pressure; wide capacity range.

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Filter Presses • Filter Media • Diaphragm Pumps

When inquiring check CP 6109 on handy form, pgs. 2-3

NEW LITERATURE

Repair, don't junk, heat exchangers

Heat exchanger repair facilities are described in 4-page bulletin. Manufacturer rebuilds and retubes pressure vessels, jacketed kettles and agitated reactors. Redesigning and repairing is also done on heat exchangers, calorifiers, and condensers.

Bul 2689 is available from Manning & Lewis Engineering Co., Dept. CP, 28-42 Ogden St., Newark 4, N. J. When inquiring specify CP 6110 on handy form, pages 2 and 3.

Welding directory covers hard surfacing

Detailed instructions on methods, materials, and procedures for arc weld surfacing are given in 20-page bulletin. Beginning with a preface to surfacing, text continues with complete description of hard surfacing, extensively illustrated. One section is devoted to fluxes, while others discuss electrodes and their properties as applied to specific operations.

Bul 466 is issued by The Lincoln Electric Co., Dept. CP, 22801 St. Clair Ave., Cleveland 17, Ohio. When inquiring specify CP 6111 on handy form, pages 2 and 3.

Organic chemical list supplemented

Second supplement to current published list (No. 38) of 3500 organic chemicals is now available. Supplement lists 47 additions, showing the name of the chemical, its melting and boiling points, structural formula, molecular weight, and price according to quantity. It also includes removals and price changes.

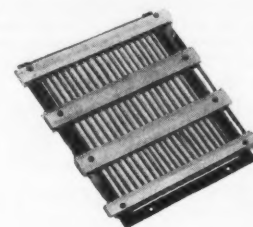
Supplement No. 2 to Cat No. 38 is available from Eastman Organic Chemicals, Distillation Products Industries, Div. of Eastman Kodak Co., Dept. CP, Rochester 3, N. Y. When inquiring specify CP 6112 on handy form between pages two and three.

Is There an Eye Dropper in the House?

If it was purchased fairly recently, chances are it was made with the help of

"Folded-and-Formed" HEATING ELEMENTS

Yes...the glass portion annealed and formed, and the rubber portion cured, in equipment electrically heated by these Trent patented elements.



This is just one of hundreds of different applications for "Folded-and-Formed" Heating Elements...unequalled for efficiency and long-life economy. Made in Standard or Custombuilt Racks, arranged to provide any required K. W., at temperatures to 1350°F.

What is YOUR Heating Problem?
Write for "Folded-and-Formed" literature, or consult our Engineering Department.

TRENT INC
Electrically Heated Industrial Equipment
235 LEVERINGTON AVE. PHILA 27, PA.
(In Canada, Montreal, Quebec, Canada, Canada)

When inquiring check CP 6113 on handy form, pgs. 2-3

MORSE DeLUXE 500 Portable ROTATOR

- MIXES
- BLENDS
- TUMBLES
- CLEANSSES



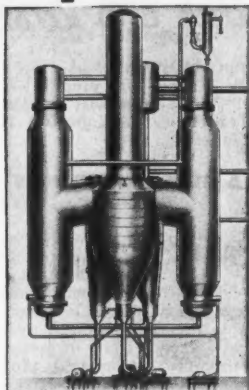
Faster and at less cost!

The patented Morse De Luxe 500 Rotator will handle 1 to 55 gal. containers, weighing to 500 lb. They revolve safely, smoothly, efficiently at 10, 20, 40 rpm on this powerful, compact, portable, motorized unit. Cuts cost of mixing, blending, tumbling, cleansing. Easily moved and loaded by one man. Has 3/4" dia. power driveshaft with self-aligning ball bearings. Four adjustable 4" dia. Neoprene-tread drive wheels. Fully enclosed worm-gear drive with 30-1, 15-1, 7 1/2-1 reductions. Weighs 137 lb. Delivered complete with motor, drive mechanism and tipping lever. Write for Bul. #1053 and catalog, showing full Morse line of Drum and Barrel handling equipment.

MORSE MANUFACTURING CO. INC
757 West Manlius St. East Syracuse, N. Y.

When inquiring check CP 6114 on handy form, pgs. 2-3

45° to 100° Evaporation



THE Mojonner Lo-Temp Evaporator provides evaporation as low as 45° F. and complete recovery of condensate. Present applications in the Chemical Process Industries include concentration of heat sensitive pharmaceuticals and antibiotics, low temperature fractionation and distillation of solutions, and distillation of flavor extracts and essences. In the Lo-Temp, high pressure ammonia gas is used as the heating medium, and low pressure ammonia is used to condense the vapors from the product. Advantages of this system are:

1. 45° to 100° evaporation, and complete condensate recovery.
2. Operating costs 27%-55% less than steam evaporators.
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10. Lower overall capital investment in evaporator and auxiliary equipment.
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Available in packaged Laboratory Model; Pilot Models; and large capacity Commercial Models. For detailed information, write
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OTHER MOJONNER PRODUCTS FOR THE CHEMICAL INDUSTRY INCLUDE: ZONE-CONTROL VENTS • COLD-WALL TANKS • COMPACT COOLERS • VACUUM FILTERS • SPRAY DRYERS • TUBULAR EVAPORATORS

When inquiring check CP 6115 on handy form, pgs. 2-3

Convention & Exhibit

Schedule

1954

Jan. 19. Commercial Chemical Development Association, Winter Meeting (closed), Hotel Statler, St. Louis, Missouri.

Jan. 25-28. Plant Maintenance & Engineering Show, International Amphitheater, Chicago, Ill.

Jan. 26-28. Association of American Soap & Glycerine Producers, Inc., 27th Annual Industry Convention, Waldorf-Astoria Hotel, New York City, New York.

Jan. 27-29. Society of Plastics Engineers, 10th Annual Technical Conference, Royal York Hotel, Toronto, Ontario.

Jan. 27-29. American Management Association, Conference on Marketing, Hotel Roosevelt, New York City, New York.

Feb. 3-5. Ninth Annual SPI Reinforced Plastics Division Conference, Society of the Plastics Industry, Inc., Edgewater Beach Hotel, Chicago, Ill.

Feb. 4. The Instrument Society of America, 9th Annual Regional Conference, Hotel Statler, New York, New York.

Feb. 18-19. The Chemical Institute of Canada, 6th Divisional Conference, Analytical Chemistry Division, Royal Hotel, Guelph, Ontario.

Feb. 25-26. The Chemical Institute of Canada, 8th Divisional Conference, Protective Coatings Division, Montreal (25th) and Toronto (26th).

Mar. 1-2. The Chemical Institute of Canada, 3rd Divisional Conference, Chemical Engineering Division, Montreal.

Mar. 8-10. American Institute of Chemical Engineers, Washington, D.C.

Mar. 15-19. National Association of Corrosion Engineers, 1954 Conference and Exhibition, Kansas City, Missouri.

Mar. 17-18. Commercial Chemical Development Association, Annual Open Meeting, Hotel Statler, New York City, New York.

Mar. 24-Apr. 1. American Chemical Society, 125th national meeting, Kansas City, Missouri.

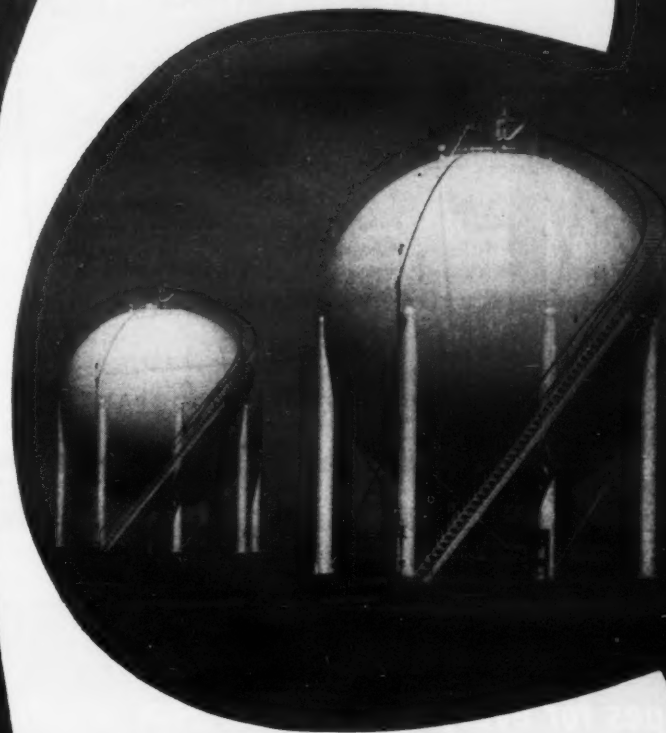
April 5-6. The Society of the Plastics Industry (Canada) Inc., 12th Annual Conference, Mount Royal Hotel, Montreal, Canada.

Apr. 5-8. American Management Association, 23rd National Packaging Exposition, Auditorium, Atlantic City, New Jersey.

Apr. 14-16. American Chemical Society, Division of Rubber Chemistry, 65th meeting, Brown Hotel, Louisville, Kentucky.

HORTONSPHERES

provide vital storage
for new
petrochemical plant



Operations start here, in these Hortonspheres®, at Celanese Corporation of America's new petrochemical plant at Pampa, Texas. The Hortonspheres provide pressure storage for liquefied butane and propane which are later processed with water and air to make valuable commercial chemicals.

Hortonspheres are widely used for the storage of volatile liquids and gases. If there is a chance that your operations could be improved by a pressure storage vessel, write our nearest office for estimates or quotations on a welded steel Hortonsphere. There is no obligation on your part.

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Cleveland 15	2212 Midland Bldg.	Salt Lake City 4	507 West 17th St.
Detroit 26	1535 Lafayette Bldg.	San Francisco 4	1545-200 Bush St.
Havana	402 Abreu Bldg.	Seattle 1	1307 Henry Bldg.
Houston 2	2151 C & I Life Bldg.	Tulsa 3	1649 Hunt Bldg.

Plants at BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA.

When inquiring check CP 6116 on handy form, pgs. 2-3

for Pumping SULPHUR



Request BULLETIN V-837

FIG. 19.478

This TABER steam jacketed, Vertical Pump was designed to handle molten sulphur. Note the massive construction. Supporting the suspended pump from channel steel permits the use of an open shaft. This is especially desirable for molten sulphur.

Steam jacketed discharge pipe keeps molten materials from solidifying.

Pump operates efficiently at the relatively slow speed of 1750 r.p.m. (We consider 3600 r.p.m. prohibitive because molten sulphur has no lubricating properties.)

Write us the Head, and gpm you wish to handle together with the depth of your sulphur pit, and we shall send further information, with BULLETIN V-837.

TABER PUMP COMPANY
320 ELM STREET • BUFFALO 3, N. Y.

TABER PUMPS

Est. 1859

When inquiring check CP 6117 on handy form, pgs. 2-3

Circular Collectors

Types for every waste treatment problem



SUSPENDED COLLECTORS are used where a simple bridge can span the tank diameter. In this case, the complete motor and drive assembly, together with the drive tube and collector arms, are suspended from the bridge.

WRITE FOR BULLETIN 9W65

CLARIFLOW THICKENER

This unit utilizes the principles of fluid mechanics, so highly developed in Walker sedimentation units. It removes all settleable solids and remarkably clarifies the flow. All parts are sturdily built... designed for the "tough" jobs.

WRITE FOR BULLETIN 10169

PIER DRIVE COLLECTOR

The Pier Drive Collector is recommended where it is undesirable to operate a Tractor Drive... where the access bridge must be stationary, or the corners of square tanks must be scraped. Center drive mechanisms, ranging from 1/2 to 10 horsepower, are built for long life and heavy duty service. Worms are carburized and ground steel and precision meshed with hardened bronze worm wheels. The balls run in hardened, ground, renewable ball races.



WALKER PROCESS EQUIPMENT INC.
FACTORY • ENGINEERING OFFICES • LABORATORIES
AURORA, ILLINOIS

When inquiring check CP 6118 on handy form, pgs. 2-3

NEW LITERATURE

Informative bulletin simplifies choice of portable pH meters

The advantages and importance of pH control in chemical processes is outlined in a factual, 4-page bulletin. Salient performance features and characteristics of a complete line of pH meters are described, and four meters are pictured — a precision laboratory unit, a line-operated model and two rugged lightweight portable units for plant and field applications.

Bul 322-11 is issued by Beckman Instruments, Inc., Dept. CP, 820 S. Mission St., South Pasadena, Calif. When inquiring specify CP 6119 on handy Reader Service slip located between pages 2 and 3.

Book on ferrocyanides available

Cloth-bound, 112-page glossy-paper book presents summary of known physical and chemical properties of sodium of potassium ferrocyanides and of hydroferrocyanic acid. Present and proposed application, graphs, tables and bibliography are included.

"The Chemistry of the Ferrocyanides" is available on letterhead request from the Industrial Chemicals Division, Dept. CP, American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y.

Presents info on developments in laboratory apparatus

One of several interesting and informative articles in recent bulletin deals with the testing of high vacuum pumps. Another contains information about a line of frequency standards, while an oil diffusion pump is described in a third. Concluding section describes a guard for vacuum pumps; an air freshener for laboratories; a compact, portable pH meter; a dew point tester; a 3-dimensional microscope; and a table-model electropolisher.

"Cenco News Chats," No. 77 is issued by Central Scientific Co., Dept. CP, 1700 Irving Park Rd., Chicago 13, Ill. When inquiring specify CP 6120 on handy Reader Service slip located between pages 2 and 3.

Molecular chain stopper used in oil alkyd resins

Manufacturer's 7-page technical bulletin explains use of Bethal in production of short and medium oil alkyd resins to control viscosity until desired acid number is obtained. Bethal, a monobasic composition, acts as molecular chain stopper controlling viscosity without resorting to larger than optimum ratios of glycerine or pentaerythritol to phthalic anhydride. Improved resin durability,

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When inquiring check CP 6121 on handy form, pages 2-3

CHEMICAL PROCESSING

NEW LITERATURE

alkali and water resistance, and film gloss are claimed as results when Bethol is substituted for excess amounts of polyalcohols.

Bul 0-103 is issued by Monsanto Chemical Co., Dept. CP, 1700 S. Second St., St. Louis 4, Mo. When inquiring specify CP 6122 on handy form, pages 2 and 3.

Dozens of instruments pictured, explained

Revised edition of measuring equipment catalog is a 64-page publication. Information on more than 115 testing and measuring devices is provided. Liberally illustrated, catalog covers electrical meters, oscillographs, surface roughness scales, mass spectrometers, DC amplifiers and a host of other instruments.

Brief description is given for each instrument. Field of application is outlined and condensed tables of important characteristics are provided.

GEC-1016A is issued by General Electric Co., Dept. CP, Schenectady 5, N. Y. When inquiring specify CP 6123 on convenient form, pages 2 and 3.

Combination air release and air inlet valve described

Small unit automatically releases air accumulations from systems, admits air to break vacuums and vents large quantities of air when filling systems with water. General description, discharge capacities, uses and dimensions of unit are reported in 4-page bulletin.

Bul 1203 is issued by Simplex Valve & Meter Co., Dept. CP, 68th and Upland St., Philadelphia, Pa. When inquiring specify CP 6124 on handy form, pages 2 and 3.

Industrial jobs for air hose

A number of different uses for manufacturer's line of air hose are described in four-page bulletin. Uses vary from heavy-duty construction through digging and drilling operations, to many heavy and light industrial and commercial uses for air hose. Included are cross-section and cutaway photos, as well as performance data, constructions, sizes, weights, working pressures and recommended uses. Also covered are types of couplings best suited for specific hose.

Bul "Quaker Air Hose" is issued by Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Dept. CP, Tacony and Comly St., Philadelphia 24, Pa. When inquiring specify CP 6125 on handy form, pages 2 and 3.



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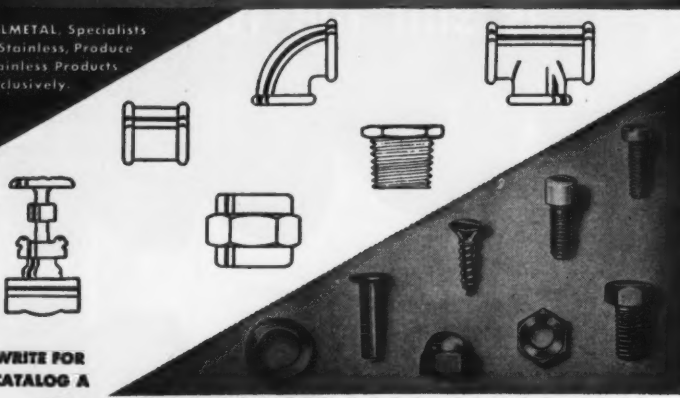
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NEW LITERATURE

Describes clutch which acts as automatic shear pin

Torque-limiting slip-type friction clutches, which provide overload protection for a variety of machine drives by functioning as an automatic shear pin mechanism, are described in data sheet.

Dimensions and capacities of standard 4½, 5½, and 6½" diameter adjustable clutches are presented. Tables of specifications of manufacturer's standard Type A plain plate roller chain sprockets that can be used in connection with the compact torque-limiting clutches are also included.

Form S31-53 is available from Morse Chain Co., Dept. CP, 7601 Central Ave., Detroit 10, Mich. When inquiring specify CP 6129 on handy form, pages 2 and 3.

Measures specific gravity of gases

Four-page catalog covers components of system to measure specific gravity of gases.

Several applications are detailed, lists of general specifications and breakdowns of equipment are given for transmitting-recording or transmitting-recording-controlling installations. Cat 14-A-12 is issued by Fischer & Porter Co., Dept. CP, 842 Jacksonville Road, Hatboro, Pa. When inquiring specify CP 6130, pages 2 and 3.

Frictional losses vs flow rates of metal hose charted

Charts on frictional losses versus flow rates in flexible metal hose are included in 50-page, two-color catalog. Photographically presented is the story of how seamed metal hose is made. Line drawings, charts and pictures accompany text describing and specifying complete line of company's flexible hose and fittings. One section of catalog is devoted entirely to engineering data. This includes instructions for use, installation, and care of hoses.

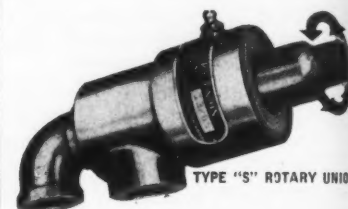
Cat 200 is available from Titeflex, Inc., Dept. CP, 500 Frelinghuysen Ave., Newark 5, N. J. Specify CP 6131, pages 2 and 3.

Introduces general purpose pump for industry

Catalog sheet illustrates and outlines features of manufacturer's recently introduced general purpose pump for industrial and other uses. Two-color literature describes specifications of the pump, shows performance tables for each pump size, illustrates applications of units and of various drive assemblies. Pump, which incorporates a 12-vane impeller design, is said to reduce friction



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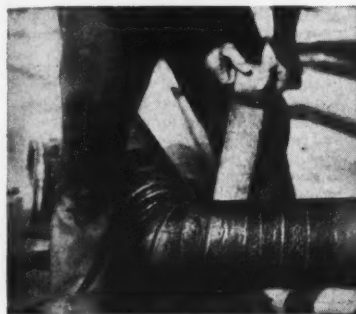
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NEW LITERATURE

loss and exhibit better performance characteristics than previous units.

Form 2531 is available from Dept. KP, Hypro Engineering, Inc., Dept. CP, 404 N. Washington Ave., Minneapolis 1, Minn. When inquiring specify CP 6134 on handy form, pages 2 and 3.

Describes automation of pH control

Illustrated technical bulletin is a reprint of an article on "Automatic pH Control in Water and Industrial Waste Treatment." Several types of systems of automatic pH control are outlined. Air and motor operated valves as well as control volume pumps are shown in their applications.

Tech Bul 55 is issued by Station E, Milton Roy Co., Dept. CP, 1300 E. Mermaid Lane, Philadelphia 18, Pa. When inquiring specify CP 6135 on handy form, pages 2 and 3.

Shows latest developments in waste engineering

What's new in waste engineering in design of sewage and industrial projects is displayed in words and pictures of 34-page brochure. Back cover pocket includes a smaller edition of the large book with project lists.

Brochure "Sanitary Engineering" is available on letterhead request to Dept. SS, Gilbert Associates, Inc., Dept. CP, 412 Washington St., Reading, Pa.

Pipeline expansion problem solved

Types of pipeline motion and methods of handling them are discussed in 8-page bulletin. Also considered are proper selection and application of pipeline expansion joints. Guiding and anchoring installations, tables and illustrations are included.

Bul 133 is available from Flexonics Corp., Dept. CP, 1319 S. Third Ave., Maywood, Ill. When inquiring specify CP 6136 on handy form, pages 2 and 3.

Keeps edges true

Illustrated 12-page bulletin pictures, explains, and describes hydraulic controller for maintaining edge of any spooled web in desired position on roll. Several application photos are included along with cutaways, diagrams, and drawing. Bul 161 is issued by Askania Regulator Co., Dept. CP, 240 E. Ontario St., Chicago 11, Ill. When inquiring specify CP 6137 on handy form, pages 2 and 3.

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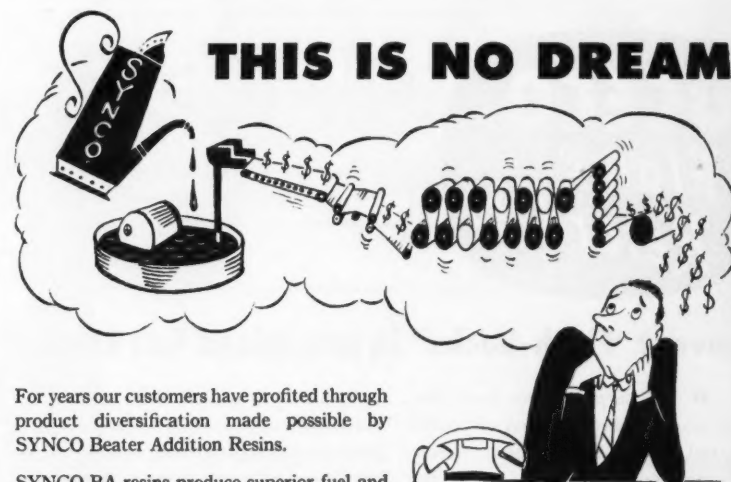
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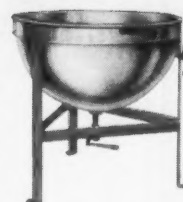
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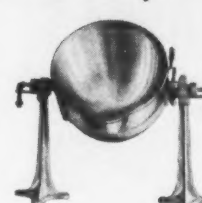
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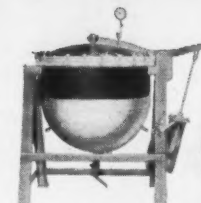
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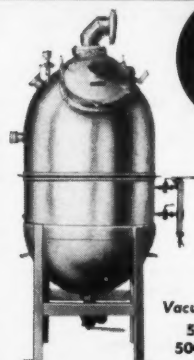
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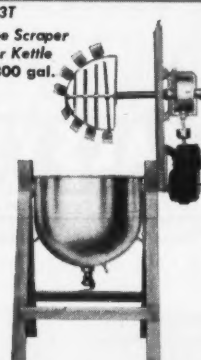


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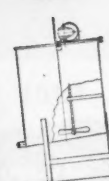
CW3T
Center-line Scraper
Agitator Kettle
80 to 300 gal.



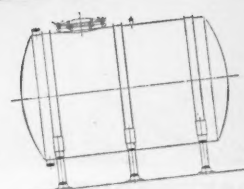
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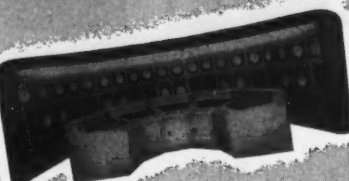
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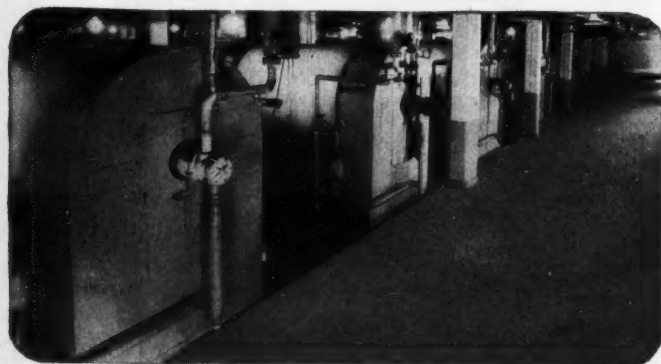
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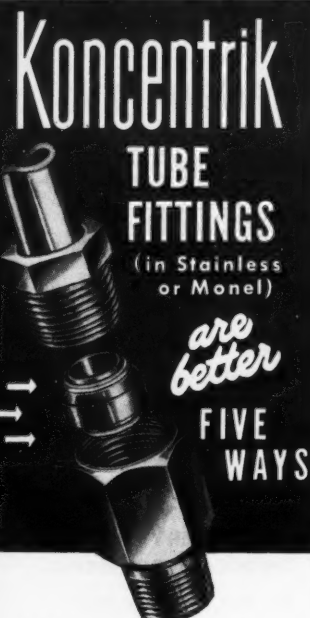
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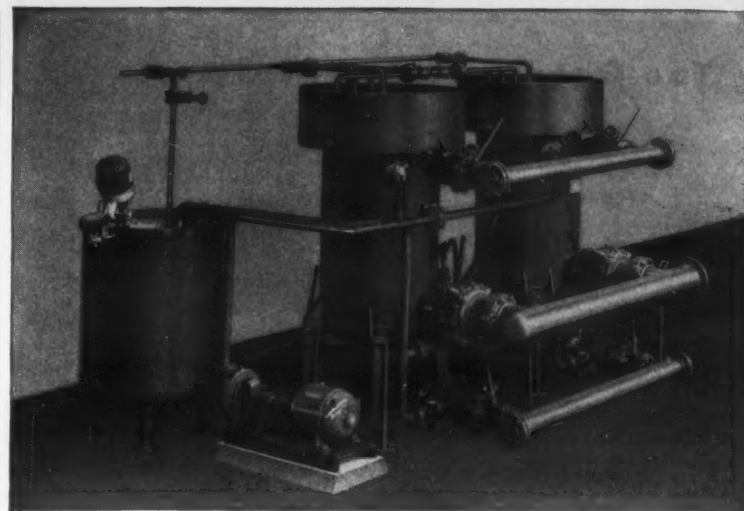
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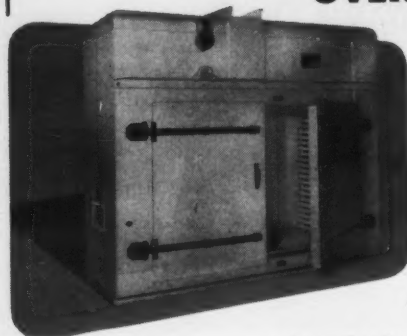
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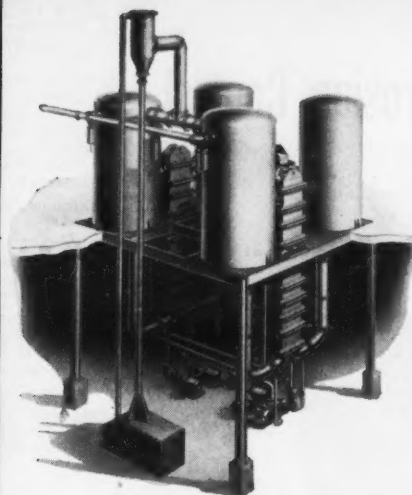


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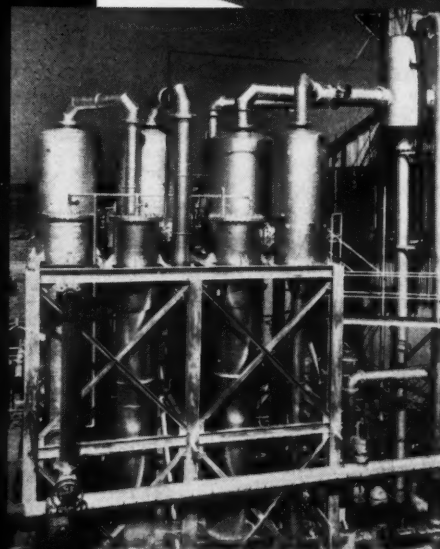
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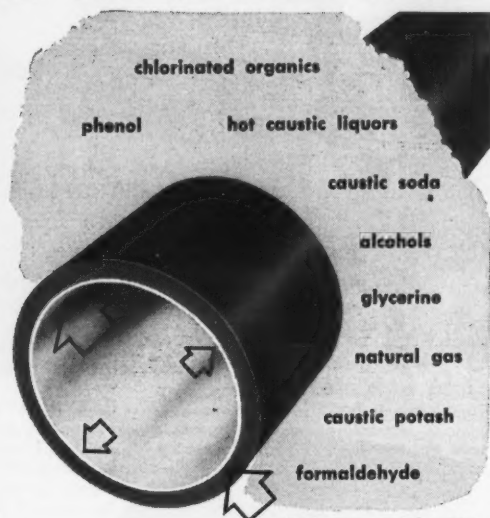
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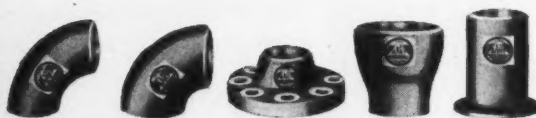
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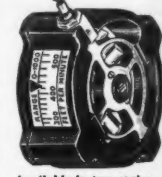
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Write for Bulletin I-760

BACHARACH Industrial Instrument Co.

7301 PENN AVENUE • PITTSBURGH 8, PA.

When inquiring check CP 6150 on handy form, pgs. 2-3

Barnstead Mixed Bed Demineralizers

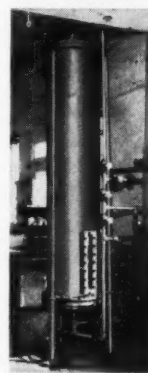
10 to 2500 Gallons or more per Hour

Sturdy construction and simplified design, plus a new, improved regeneration system make Barnstead Mixed Bed Demineralizers outstanding in performance.

Easy to operate — easy to regenerate — they produce ion-free water at very low cost, and you get more gallons between regenerations.

Each unit complete with regenerant tanks, flow meter, pressure gage, purity indicator, and simplified regeneration. Steel columns lined with heavy sheet rubber.

WRITE FOR NEW BULLETIN #126 on Mixed Bed Demineralizers



In 3 years of operation, this 500 gph Barnstead Demineralizer has produced over 4 million gals. of high purity demineralized water with a minimum of maintenance or attention.



66 LANESVILLE TERRACE



FOREST HILLS BOSTON 31 MASS.

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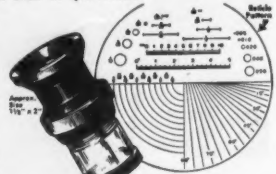


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THIS TOUGH CONCRETE PATCH SETS INSTANTLY!

Repair broken factory floors without the usual traffic tie-up. Simply shovel INSTANT-USE into hole or rut—tamp smooth—truck over! No waiting! INSTANT-USE bonds tight to old concrete—right up to a feather edge. It's tough. Wears like iron. Won't crack or crumble. Install complete overlay where floors are badly chewed up. Used indoors or out. Immediate shipment.

MAIL COUPON FOR TRIAL OFFER AND FREE HANDBOOK

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Please send me complete INSTANT-USE information, details of TRIAL ORDER PLAN and HAND BOOK OF BUILDING MAINTENANCE—no obligation. (Clip and attach Coupon to Co. letterhead).

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HOT — COLD — CONCENTRATED — DILUTED
TEMPERATURES FROM —150° F. TO +500° F.
Specify Style No. 401 for everything but molten alkali metals, fluorine, hot phosphoric acid and hydrofluoric acid. (Specify Style No. 402 Lubricated Teflon Blue Asbestos Packing without glass fiber core for hot phosphoric acid and hydrofluoric acid).

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- (1) Lack of resiliency
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- (3) Cold flow
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Flexrock has licked them all with Style #401. Don't count Teflon out until you've tried it — at our expense — wherever Teflon Packings have failed in the past.

We'll gladly send you literature but you can't pack valves or pumps handling hard-to-hold acids, alkali, or solvents with a catalog — only #401 itself will do the job.

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Company _____
Address _____
City _____ Zone _____ State _____
Please clip coupon to Company letterhead

When inquiring check CP 6155 on handy form, pgs. 2-3

CHEMICAL PROCESSING

"That's Interesting"

Lawnmowers, cannibals and caterpillars

Insecticides (like Hercules' Toxaphene) repelled the invasion of armyworms into the Mid-west and East last spring, but the memory lingers. Thus comes the story of the enterprising Illinois homeowner who offered to rent out the pesty worms to trim his neighbor's lawns . . . and the report that the bugs, not satisfied with all that green stuff, started chomping on each other.

Incidentally, while farmers, fliers, and insecticide suppliers were working around the clock to halt the march of the armyworms, a report came from northeastern Minnesota that rail and highway traffic was stopped until roads could be sanded . . . seems that tent caterpillars get slippery when squashed.

And it has occurred to us that "snow-worms" would be helpful starting about this time of year.

Found! The drop in the bucket

Using new X-ray and spectrographic analysis, scientists can detect a drop of oil in 250 barrels of water. ("True Enough" N.E.I., Inc.)

Starched ice cubes

Perhaps this can be passed along to the little woman as a "homemaker" hint. We hear that you can freeze an extra-heavy starch solution (using triple the recommended heavy solution measurement) in ice cube trays, then store them in plastic bags in the freezer. A 14-cube tray holds one quart of solution, and the starched cubes can be thawed and diluted in water on washday to the strength desired. (American Magazine)

Chemical sartor

We hear that a Government agency is experimenting with a chemical growth regulator to "tailor" crop plants and trees. Many possibilities are obvious, but if it would cut down time spent with hedge clippers or lawnmower during summer months, possibilities turn into downright necessities.

Wrappings from the grave

Combine some 19th century American history with a shred of Ancient Egyptian history and no telling what kind of reaction you'll get, including chemical.

Seems that paper was short in this country around Civil War times, so an enterprising Easterner ordered mummies from Egyptian tombs, stripped the linen wrappings from them, and made (naturally) wrapping paper from those long shrouds. A few years after all this started, the gentleman's chief competition for the grisly bundles came from the Egyptian railroads, which burned no other fuel for ten years than mummies—wrappings, trappings, and occupants. (The Agitator)

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NOW YOU CAN GET PIPE FITTINGS

AT AN UNMATCHED LOW COST . . .

MADE WITH RIGID PVC* . . .

THE UNMATCHED PLASTIC

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These and other advantages are characteristic of JACOX fittings, available in a range of sizes and materials to meet exacting specifications.

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* Rigid polyvinyl chloride

** Chemical property chart will be furnished on request

MECHANICAL PROPERTIES

Tensile Strength, psi. 8,500 to 9,000
Compressive Strength, psi. . . 11,000 to 12,000
Compressive Yield Stress, psi. 10,000 to 11,000
Flexural Strength, psi. 13,000 to 14,000
Yield Strength
in Flexure, psi. 10,000 to 11,000
Izod Impact Strength, Notched,
ft.-lbs./in. (1/4" x 1/2" bar) 0.5 to 19.0
Rockwell Hardness, R Scale . 117 to 120
Shore Hardness, D Scale 85

THERMAL PROPERTIES

Heat Distortion Temperature
at 66 psi., C. 73-75

MISCELLANEOUS PROPERTIES

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75°F. — 24 hrs.032
Specific Gravity 1.40-1.5
Flammability — Self extinguishing.



corporation

DIVISION OF JACKSON & CHURCH CO.

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Saginaw, Michigan

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are at home in every-day
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